APPENDIX A

STATE AND FEDERAL AGENCY CONTACTS

Appendix A
State and Federal Agency Contacts

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) AGENCY INFORMATION
Water Quality Division (WQD)
122 W 25th St
Herschler Bldg – 4W
Cheyenne, WY 82002
District Offices
Casper: 307-473-3465
Cheyenne: 307-777-7781
Lander: 307-332-3144
Sheridan: 307-673-9337
* Leaking Underground and Above Ground Storage Tanks
* Surface Water Discharge Permits (NPDES)
* Storm Water Pollution Prevention Plans & Permits
* Sewage Treatment Plants & Wastewater Permits
* Industrial Wastewater Treatment Plants
* Animal Waste Management Facilities (over 1000 animal units)
* Injection Wells (Classes I, III, IV & V)
* Groundwater Monitoring Systems and Water Quality Information
* Private Septic System Rules and Permits for the 8 Undelegated Counties
* Source Water and Wellhead Protection, Source Water Assessments
* Groundwater Pollution Control Sites/Known Contamination Sites
* Groundwater Pollution Investigations
* Groundwater Sensitivity and Aquifer Vulnerability Maps
* Land use maps
* Well characteristic database
* Public Water System (PWS) Construction Permits
* Non-Point Source Pollution Control Program
* Subdivision Permit Reviews

Solid and Hazardous Waste Division (SHWD)
122 W. 25th St
Herschler Bldg – 4W
Cheyenne, WY 82002
District Offices
Cheyenne: 307-777-7752
Lander: 307-332-6924
Casper: 307-473-3450
Sheridan: 307-673-9337
* Hazardous Material Treatment, Storage and Disposal Facilities
* RCRA Permits/Hazardous Waste Facility Cleanup
* Solid Waste Management Storage, Treatment and Disposal Facilities (land farms, landfills, etc.)
* Incinerators, Transfer Stations, Recycling Centers
* Pollution Prevention (Assistance to Industry Regarding Source Reduction, Recycling or Treatment to Reduce Toxicity or Volume)
* Spills, Leaks, Complaint Investigations

Land Quality Division (LQD)
122 W. 25th St
Herschler Bldg – 3W
Cheyenne, WY 82002
District Offices

Cheyenne: 307-777-7756
Lander: 307-332-3047
Sheridan: 307-672-6488
* Mine Permits
* Underground Mines
* Above Ground Mines

Abandoned Mine Lands Division (AML)
122 W 25th St
Herschler Bldg – 3W
Cheyenne, WY 82002
District Offices
Cheyenne: 307-777-6145
Lander: 307-332-5085
Casper: 307-473-3460
Sheridan: 307-673-9337
* Abandoned Mine Areas
* Acid Mine Drainage

Wyoming Oil and Gas Conservation Commission (OGCC)
Casper: 307-234-7147
* Oil & Gas Wells
* Oil and Gas Production, Refining, Transport (Pipelines) & Storage Facilities
* Class II Injection Wells

Wyoming State Geologic Survey (WY GS)
Laramie: 307-766-2286
* General Geologic information
* Geologic and Topographic Maps
* Mineral Production and Reserves

Wyoming State Engineer's Office (SEO)
Groundwater Division
Cheyenne: 307-777-6163
* Well Completion Reports; Permits for water supply wells and monitoring wells
* Groundwater Resource Information

Wyoming Department of Agriculture
Technical Services
Cheyenne: 307-777-6590
* Certification of Pesticide Applicators
* Pesticide and Fertilizer Best Management Practices (BMPs)

Wyoming Department of Transportation (DOT)
Maintenance Dept.
Cheyenne: 307-777-6590
* Identification of DOT Storage Sites of regulated and non-regulated substances (e.g., salt)
* Hazardous Cargo Shipments and Routes
* Chemical Usage Locations
* Aerial Photography Services

University of Wyoming Spatial Data and Visualization Center
Laramie: 307-766-2532
* Groundwater Sensitivity Maps and Aquifer Vulnerability Maps

University of Wyoming Water Resources Data System
Laramie: 307-766-6651
* Water Quality Databases
* Wyoming Water Bibliography
* Public Water System Databases

Wyoming Association of Rural Water Systems (WARWS)
P.O. Box 1750
Glenrock, WY 82637
307-436-8636
* Source Water and Wellhead Protection Planning
* Source Water Assessments

US Environmental Protection Agency (EPA), WY Direct Implementation Team
999 18th ST., Suite 500
8P-W-MS
Denver, CO 80202-2466
1-800-227-8917
* Safe Drinking Water Information System (SDWIS)
* Sanitary Surveys
* Monitoring Data

Trihydro and Lindstone
* Source Water and Wellhead Protection Planning
* Source Water Delineations

APPENDIX B

METADATA

APPENDIX B-1

METADATA - AERIAL PHOTOS

Metadata for Digital Orthophoto Quadrangles

These metadata describe the Digital Orthophoto Quadrangle holdings of the Wyoming Spatial Data Clearinghouse for the state of Wyoming. This is a data-set level implementation of the Content Standards for Digital Geospatial Metadata and the bounding coordinates contained herein apply to the statewide coverage as a whole, not to any particular DOQ.

Identification_Information:

Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date:
Title: Digital Orthophoto Quadrangles
Geospatial_Data_Presentation_Form: remote-sensing image
Publication_Information:
Publication_Place: Reston, VA
Publisher: U.S. Geological Survey
Description:
Abstract:
Orthophotos combine the image characteristics of a photograph with the geometric qualities of a map. The primary digital orthophotoquad (DOQ) is a 1-meter ground resolution, quarter-quadrangle (3.75-minutes of latitude by 3.75-minutes of longitude) image cast on the Universal Transverse Mercator Projection (UTM) on the North American Datum of 1983 (NAD83).The geographic extent of the DOQ is equivalent to a quarter-quad plus The overedge ranges a minimum of 50 meters to a maximum of 300 meters beyond the extremes of the primary and secondary corner points. The overedge is included to facilitate tonal matching for mosaicking and for the placement of the NAD83 and secondary datum corner ticks. The normal orientation of data is by lines (rows) and samples (columns). Each line contains a series of pixels ordered from west to east with the order of the lines from north to south. The standard, archived digital orthophoto is formatted as four ASCII header records, followed by a series of 8-bit binary image data records. The radiometric image brightness values are stored as 256

gray levels ranging from 0 to 255. The metadata provided in the digital orthophoto contain a wide range of descriptive information including format source information, production instrumentation and dates, and data to assist with displaying and georeferencing the image.
Purpose:
DOQ's serve a variety of purposes, from interim maps to field references for earth science investigations and analysis. The DOQ is useful as a layer of a geographic information system and as a tool for revision of digital line graphs and topographic maps.
Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19940222
Ending_Date: present
Currentness_Reference: ground condition
Status:
Progress: In work
Maintenance_and_Update_Frequency: irregular
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -112.0000
East_Bounding_Coordinate: -104.0000
North_Bounding_Coordinate: 45.0000
South_Bounding_Coordinate: 41.0000
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: DOQ
Theme_Keyword: DOQQ
Theme_Keyword: digital orthophoto
Theme_Keyword: digital orthophotoquad
Theme_Keyword: digital image map
Theme_Keyword: aerial photograph
Theme_Keyword: rectified photograph
Theme_Keyword: rectified image
Theme_Keyword: orthophoto
Theme_Keyword: quarter-quadrangle orthophoto
Theme_Keyword: 1-meter orthophoto
Theme_Keyword: 2-meter orhtophoto
Theme_Keyword: 3.75- x 3.75-minute orthophoto
Theme_Keyword: 7.5- x 7.5-minute orthophoto
Place:
Place_Keyword_Thesaurus:
U.S. Department of Commerce, 1977, Countries, dependencies, areas of special sovereignty, and their principal administrative divisions (Federal Information

Processing Standard 10-3):Washington, D.C., National Institute of Standards and Technology.
Place_Keyword: US
Place_Keyword: WY
Place:
Place_Keyword_Thesaurus:
U.S. Department of Commerce, 1987, Codes for the identification of the States, the District of Columbia and the outlying areas of The United States, and associated areas (Federal Information Processing Standard 5-2): Washington, D. C., National Institute of Standards and Technology.
Place_Keyword: FIPS code of State or Province
Place:
Place_Keyword_Thesaurus:
U.S. Department of Commerce,1990, Counties and equivalent entities of The United States, its possessions, and associated areas (Federal Information Processing Standard 6-4): Washington, D.C. National Institute of Standards and Technology.
Place_Keyword: FIPS code for county or counties.
Access_Constraints: None
Use_Constraints:
None. Acknowledgement of the U.S. Geological Survey would be appreciated in products derived from these data.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
During photographic reproduction of the source photography, limited analog dodging is performed to improve image quality. Analog dodging consists of holding back light from certain areas of the sensitized photographic material to avoid overexposure. The diapositive is inspected to insure clarity and radiometric uniformity. Diapositive image brightness values are collected with a minimum of image quality manipulation. Image brightness values may deviate from brightness values of the original imagery due to image value interpolation during the scanning and rectification processes. Radiometry is verified by visual inspection of the digital orthophoto quadrangle with the original unrectified image to determine if the digital orthophoto has the same or better image quality as the original unrectified input image. Slight systematic radiometric differences can be detected between adjacent DOQ files due primarily to differences in source photography capture dates and sun angles of aerial photography along flight lines. These differences can be observed in an image's general lightness or darkness when compared to adjacent DOQ file coverages.
Logical_Consistency_Report:
All DOQ header data and image file sizes are validated by the Tape Validation System (TVS) software prior to archiving in the National Digital Cartographic Data Base (NDCDB). This validation procedure assures correct physical format

and field values for header record elements. Logical relationships between header record elements are tested.

Completeness_Report:

All DOQ imagery is visually inspected for completeness to ensure that no gaps, or image misplacement exist in the 3.75' image area or in overedge coverage. DOQ images may be derived by mosaicking multiple images, in order to insure complete coverage. All DOQ's are cloud free within the 3.75' image area. Some clouds may, very infrequently, be encountered only in the overedge coverage. Source photography is leaf-off in deciduous vegetation regions. Void areas having a radiometric value of zero and appearing black may exist. These are areas for which no photographic source is available or result from image transformation from other planimetric systems to the Universal Transverse Mercator (UTM). In the latter case, the void sliver areas are on the outside edges of the overedge area. The data set field content of each DOQ header record element is validated to assure completeness prior to archiving in the NDCDB.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The DOQ horizontal positional accuracy and the assurance of that accuracy depend, in part, on the accuracy of the data inputs to the rectification process. These inputs consist of the digital elevation model (DEM),aerotriangulation control and methods, the photo source camera calibration, scanner calibration, and aerial photographs that meet National Aerial Photography Program (NAPP) standards. The vertical accuracy of the verified USGS format DEM is equivalent to or better than a USGS level 1 or 2 DEM, with a root mean square error (RMSE) of no greater than 7.0 meters. Field control is acquired by third order class 1 or better survey methods sufficiently spaced to meet National Map Accuracy Staandards (NMAS) for 1:12,000-scale products. Aerial cameras have current certification from the USGS, National Mapping Division, Optical Science Laboratory. Test calibration scans are performed on all source photography scanners. Horizontal positional accuracy is determined by the Orthophoto Accuracy (ORACC) software program for DOQ data produced by the National Mapping Division. The program determines the accuracy by finding the line and sample coordinates of the passpoints in the DOQ and fitting these to their ground coordinates to develop a root mean square error (RMSE). From 4 to 9 points are checked. As a further accuracy test, the image line and sample coordinates of the DEM corners are transformed and compared with the actual X,Y DEM corner values to determine if they are within the RMSE. Additional information on this testing procedure can be found in U.S. Department of the Interior, U.S. Geological Survey, 1993, Technical Instructions, ORACC Users Manual (draft): Reston, VA. Adjacent DOQ's, when displayed together in a common planimetric coordinate system, may exhibit slight positional discrepancies across common DOQ boundaries. Linear features, such as streets, may not be continuous. These edge mismatches, however, still conform to positional horizontal accuracy within the NMAS. Field investigations to validate DOQ positional accuracy reliabilty are periodically conducted by the USGS, National Mapping Division, Geometronics

Standards Section. DOQ's produced by cooperators and contractors use similarly approved RMSE test procedures.
Quantitative_Horizontal_Positional_Accuracy_Assessment:
Horizontal_Positional_Accuracy_Value: RMSE
Horizontal_Positional_Accuracy_Explanation:
U.S.Bureau of the Budget, 1947, United States National Map Accuracy Standard.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: unknown
Title: digital elevation model
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Reston, VA
Publisher: U.S. Geological Survey
Type_of_Source_Media: cartridge tape
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19880805
Ending_Date: present
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: DEM1
Source_Contribution:
Elevation data in the form of an ortho-DEM regridded to user-specified intervals and bounds.
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date:
Title: photo ID number
Geospatial_Data_Presentation_Form: remote-sensing image
Publication_Information:
Publication_Place: Reston, VA
Publisher: U.S. Geological Survey
Source_Scale_Denominator: 40000
Type_of_Source_Media: cartridge tape
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: various
Ending_Date: various
Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: PHOTO1
Source_Contribution:
Panchromatic black and white (or color infra-red) NAPP or NAPP-like photograph. NAPP photographs are centered on the DOQ coverage area.
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: Unpublished material
Title: project ground and photo control
Geospatial_Data_Presentation_Form: remote-sensing image
Publication_Information:
Publication_Place: Reston, VA
Publisher: U.S. Geological Survey
Type_of_Source_Media: various media
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: various
Ending_Date: various
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: CONTROL_INPUT
Source_Contribution:
Horizontal and vertical control used to establish positions and elevations for reference and correlation purposes.
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: Unpublished material
Title: report of calibration
Geospatial_Data_Presentation_Form: remote-sensing image
Publication_Information:
Publication_Place: Reston, VA
Publisher: U.S. Geological Survey
Type_of_Source_Media: disc, paper
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: various
Ending_Date: various
Source_Currentness_Reference:
Date of the camera calibration associated with the source photography
Source_Citation_Abbreviation: CAMERA_INPUT
Source_Contribution: camera calibration parameters
Process_Step:

Process_Description:
The production procedures, instrumentation, hardware and software used in the collection of standard USGS DOQ's vary depending on systems used at the contract, cooperator or USGS production sites. The majority of DOQ datasets are acquired through government contract. The process step describes, in general, the process used in the production of standard USGS DOQ data sets.

The rectification process requires, as input, a user parameter file to control the rectification process, a digital elevation model (DEM1) gridded to user specified bounds, projection, zone, datum and X-Y units, a scanned digital image file (PHOTO1) covering the same area as the DEM, ground X-Y-Z point values (CONTROL_INPUT) and their conjugate photo coordinates in the camera coordinate system, and measurements of the fiducial marks (CAMERA_INPUT) in the digitized image.

The camera calibration report (CAMERA_INPUT) provides the focal length of the camera and the distances in millimeters from the camera's optical center to the camera's 8 fiducial marks. These marks define the frame of reference for spatial measurements made from the photograph. Ground control points (CONTROL_INPUT) acquired from ground surveys or developed in aerotriangulation, are third order class 1 or better, and meet National Map Accuracy Standard (NMAS) for 1:12,000-scale. Ground control points are in the Universal Transverse Mercator or the State Plane Coordinate System on NAD83. Horizontal and vertical residuals of aerotriangulated tie-points are equal to or less than 2.5 meters. Standard aerotriangulation passpoint configuration consists of 9 ground control points, one near each corner, one at the center near each side and 1 near the center of the photograph, are used. The conjugate positions of the ground control points on the photograph are measured and recorded in camera coordinates.

The raster image file (PHOTO_1) is created by scanning an aerial photograph film diapositive with a precision image scanner. An aperture of approximately 25 to 32 microns is used, with an aperture no greater than 32 microns permitted. Using 1:40,000-scale photographs, a 25-micron scan aperture equates to a ground resolution of 1-meter. The scanner converts the photographic image densities to gray scale values ranging from 0 to 255 for black and white photographs. Scan files with ground resolution less than 1 meter or greater than 1 meter but less than 1.28 meters are resampled to 1 meter.

The principal elevation data source (DEM1) are standard DEM datasets from the National Digital Cartographic Data Base (NDCDB). DEM's that meet USGS standards are also produced by contractors to fulfill DOQ production requirements and are subsequently archived in the NDCDB. All DEM data is equivalent to or better than USGS DEM standard level 1. The DEM used in the production of DOQ's generally has a 30-meter grid post spacing and possesses a vertical RMSE of 7-meters or less. A DEM covering the extent of the photograph

is used for the rectification. The DEM is traversed from user-selected minimum to maximum X-Y values and the DEM X-Y-Z values are used to find pixel coordinates in the digitized photograph using transformations mentioned above. For each raster image cell subdivision, a brightness or gray-scale value is obtained using nearest neighbor, bilinear, or cubic convolution resampling of the scanned image. The pixel processing algorithm is indicated in the header file . An inverse transformation relates the image coordinates referenced to the fiducial coordinate space back to scanner coordinate space. For those areas for which a 7.5-minute DEM is unavailable and relief differences are less than 150 feet, a planar-DEM (slope-plane substitute grid) may be used.

Rectification Process: The photo control points and focal length are iteratively fitted to their conjugate ground control points using a single photo space resection equation. From this mathematical fit is obtained a rotation matrix of constants about the three axes of the camera. This rotation matrix can then be used to find the photograph or camera coordinates of any other ground X-Y-Z point. Next a two dimensional fit is made between the measured fiducial marks on the digitized photograph and their conjugate camera coordinates. Transformation constants are developed from the fit and the camera or photo coordinates are used in reverse to find their conjugate pixel coordinates on the digitized photograph.

Quality Control: All data is inspected according to a quality control plan. DOQ contractors must meet DOQ standards for attribute accuracy, logical consistency, data completeness and horizontal positional accuracy. During the initial production phase, all rectification inputs and DOQ data sets are inspected for conformance to standards. After a production source demonstrates high quality, inspections will be made to 10% of delivery lots (40 DOQs per lot). All DOQ's are visually inspected for gross positional errors and tested for physical format standards.

Source_Used_Citation_Abbreviation: DEM1, PHOTO1, CONTROL_INPUT, CAMERA_INPUT
Process_Date:

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count:
Column_Count:

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator

Universal_Transverse_Mercator:
UTM_Zone_Number: 10-19
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: .09996
Longitude_of_Central_Meridian: depends on zone
Latitude_of_Projection_Origin: 0.0
False_Easting: 500000.
False_Northing: 0.0
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 1
Ordinate_Resolution: 1
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:

Overview_Description:
Entity_and_Attribute_Overview:
For DOQ's from panchromatic source each pixel contains an 8-bit gray-scale value between 0-255. A value of 0 represents the color black while a value of 255 represents the color white. All values between 0 and 255 are repesented as a shade of gray varying from black to white. For color-infrared and natural color DOQs' a digital number from 0 to 255 will also be asssigned to each pixel but that number will refer to a color look-up table which will contain the RGB red, blue and green (RGB) values, each from 0 to 255, for that digital number. Areas where the rectification process is incomplete due to incomplete data (i.e., lack of elevation data, gaps), are represented with the numeric value of 0.
Entity_and_Attribute_Detail_Citation:
U.S. Department of the Interior, U.S. Geological Survey, 1992, Standards for digital orthophotos: Reston, VA. A hypertext version is available at: ftp://www-nmd.usgs.gov/pub/doq_html/standards_doq.html

Softcopy in ASCII format is available at: ftp://www-nmd.usgs.gov/pub/ti/DOQ/doqstnds/stdoqpt1.txt ftp://www-nmd.usgs.gov/pub/ti/DOQ/doqstnds/stdoqpt2.txt

Softcopy in WordPerfect format is available at: ftp://www-nmd.usgs.gov/pub/ti/DOQ/doqstnds/stdoqpt1.wp5 ftp://www-nmd.usgs.gov/pub/ti/DOQ/doqstnds/stdoqpt1.wp5

Softcopy in PostScript format is available at: ftp://www-nmd.usgs.gov/pub/ti/DOQ/doqstnds/stdoqpt1.ps ftp://www-nmd.usgs.gov/pub/ti/DOQ/doqstnds/stdoqpt2.ps

Softcopy in hypertext is available at: ftp://www-nmd.usgs.gov/pub/doq_html/standards_doq.html

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Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Earth Science Information Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing address
Address:
Complete list of Earth Science Information Centers at: http://www-nmd.usgs.gov/esic/esic_index.html
Address: 507 National Center
City: Reston
State_or_Province: VA
Postal_Code: 22092
Contact_Voice_Telephone: 1 800 USA MAPS
Hours_of_Service: 0800-1600
Contact_Instructions:
In addition to the address above there are other ESIC offices throughout the country. A full list of these offices is at: http://www-nmd.usgs.gov/esic/esic_index.html
Resource_Description: Digital Orthophotoquad
Distribution_Liability:
Although these data have been processed successfully on a computer system at the U.S. Geological Survey no warranty expressed or implied is made by the USGS regarding the utility of the data on any other system, nor shall the act of distribution constitute any such warranty. The USGS will warrant the delivery of this product in computer-readable format and will offer appropriate adjustment of credit when the product is determined unreadable by correctly adjusted computer input peripherals, or when the physical medium is delivered in damaged condition. Requests for adjustments of credit must be made within 90 days from the date of this shipment from the ordering site.
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: State of Wyoming, A&I, ITD, Office of GIS
Contact_Address:
Address_Type: mailing address

Address: Rm. 327E Emerson Bldg.
City: Cheyenne
State_or_Province: WY
Postal_Code: 82002
Contact_Voice_Telephone: 307 777 5103
Contact_Electronic_Mail_Address: rmemme@state.wy.us
Resource_Description: Digital Orthophotoquad
Distribution_Liability:
Although these data have been processed successfully on a computer system, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data. The State of Wyoming does not waive sovereign immunity by distributing these data, and specifically retains immunity and all defenses available to it as sovereign pursuant to Wyo. Stat. § 1-39-104(a) and all other state law.

Metadata_Reference_Information:
Metadata_Date: 20000804
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: State of Wyoming, A&I, ITD, Office of GIS
Contact_Address:
Address_Type: mailing address
Address: Rm. 327E Emerson Bldg.
City: Cheyenne
State_or_Province: WY
Postal_Code: 82002
Contact_Voice_Telephone: 307 777 5103
Contact_Electronic_Mail_Address: rmemme@state.wy.us
Metadata_Standard_Name: Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

Generated by mp version 2.5.7 on Fri Aug 04 14:55:32 2000

APPENDIX B-2

METADATA - AGRICULTURAL LANDS

Agriculture Land Use of Wyoming

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator: Wyoming Water Resources Center
      Publication_Date: 199809
      Title: Agricultural Land Use of Wyoming
      Publication_Information:
        Publication_Place: Laramie, Wyoming
        Publisher: University of Wyoming Spatial Data and Visualization Center
      Online_Linkage: <URL:http://www.sdvc.uwyo.edu/clearinghouse/gw_vuln.html
  Description:
    Abstract:
      This dataset represents croplands of Wyoming as interpreted from
      1:58,200-scale National High Altitude Program (NHAP) color infrared aerial
      photography.  The photos, which were taken in 1980-1982, were interpreted
      and land use designations were hand-drawn onto plots produced at the same
      scale as the photos, using a light table. The plots were then digitized
      as polygons into  ARC/INFO 7.0.2.  Valid polygons include
      irrigated croplands, non-irrigated croplands, urban lands, golf-courses,
      and non-agricultural lands.

    Purpose:
      The purpose of this data layer is to provide a digital layer showing
      areas of agriculture and agricultural chemical use in Wyoming.  This layer
      was designed to be applied in the Wyoming Ground-Water Vulnerability
      Mapping Project.

  Time_Period_of_Content:
    Time_Period_Information:
      Range_of_Dates/Times:
        Beginning_Date: 1980
        Ending_Date: 1982
    Currentness_Reference: ground condition

  Status:
    Progress: complete
    Maintenance_and_Update_Frequency: unknown

  Spatial_Domain:
      Bounding_Coordinates:
        West_Bounding_Coordinate: -111.09
        East_Bounding_Coordinate: -103.88
        North_Bounding_Coordinate: 45.107
        South_Bounding_Coordinate: 40.95

  Keywords:
    Theme:
      Theme_Keyword: Agriculture
      Theme_Keyword: Croplands
      Theme_Keyword: Pesticides
      Theme_Keyword: Aerial photography
      Theme_Keyword_Thesaurus: none
    Place:
```

```
      Place_Keyword: Wyoming
      Place_Keyword_Thesaurus: none

  Access_Constraints: none

  Use_Constraints:
    This layer should be used at a scale no larger than 1:58,200 and
    should only be used when more current boundaries are either not available or
    unimportant.

  Point_of_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Technical Coordinator
        Contact_Organization: Spatial Data and Visualization Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 4008 University Station
        City: Laramie
        State_or_Province: Wyoming
        Postal_Code: 82071
        Country: USA
      Contact_Voice_Telephone: 307-766-2735
      Contact_Electronic_Mail_Address: arneson@uwyo.edu
      Hours_of_Service: 8:00 - 5:00 MST

  Native_Data_Set_Environment:
    The data was created in and is stored in Arc/Info 7.0.4 software for
    Unix operating system. The dataset is vector format with polygon topology,
    and because of its complexity it is retained as a double precision coverage.
    (Projections cause significant alterations to the coverage at single
precision).

Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report:
      Ground truthing was performed on Albany and Laramie
      counties which were deemed the most difficult to interpret.  Attribute
quality
      was determined to be generally very good.  Minor problems occur in areas
where
      irrigated hay can not be differentiated from stream-side riparian
vegetation.
      It should be assumed that several of these problems exist within the
statewide
      layer.

  Logical_Consistency_Report: Polygon topology has been checked and verified.

  Completeness_Report: All polygons are appropriately labeled.

  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
        Estimated accuracy for this dataset is approximately +/- 100 feet,
        though this estimation has in no way been formally tested. The
estimation is
```

based on National Mapping Accuracy standards, taking into account the source scale of the aerial photographs, limitations associated with interpreting and transcribing polygons by hand, and digitizing hand-drawn polygons on 1:58,200-scale plots.

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Title: 1:58,200 NHAP Color-IR photos
Originator: National High Altitude Program
Publication_Date: 1982
Source_Scale_Denominator: 58200
Type_of_Source_Media: film
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1980
Ending_Date: 1982
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: photos
Source_Contribution: interpretation of land use

Process_Step:
Process_Description:
February 1995 - June 1998

Photos were delineated and transcribed by hand (using a light table) to 1:58,200 scale plots
using 1:100,000-scale hydrography and roads for reference. Once transferred the plots were
digitized and attributed in ARCEDIT. A maximum RMS of 0.006 inches was used in
registration. Coverages were then edgematched and mapjoined by county initially
and then statewide.
Process_Date: 199502

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 6619

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: .001
Longitude_Resolution: .001
Geographic_Coordinate_Units: Decimal Degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: GRS1980
Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio:
298.257

```
Entity_and_Attribute_Information:
  Overview_Description:
    Entity_and_Attribute_Overview:
      >Attributes are CODE: an integer, and DESCRIBE: a 2 letter character.
      > CODE = 1 and DESCRIBE = 'ir' for irrigated cropland
      > CODE = 2 and DESCRIBE = 'ni' for non-irrigated cropland
      > CODE = 3 and DESCRIBE = 'ur' for urban or built up
      > CODE = 4 and DESCRIBE = 'na' for non-agricultural land
      > CODE = 5 and DESCRIBE = 'gc' for golf courses
    Entity_and_Attribute_Detail_Citation: n/a

Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Data Manager
        Contact_Organization: Spatial Data and Visualization Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 4008 University Station
        City: Laramie
        State_or_Province: Wyoming
        Country: USA
        Postal_Code: 82071
      Contact_Voice_Telephone: 307-766-2735
      Contact_Electronic_Mail_Address: n/a
  Distribution_Liability:
    The distributor shall not be held liable for improper or
    incorrect use of this data, based on the description of
    appropriate/inappropriate used described in this metadata
    document. The distributor makes no claims for the data's
    suitability for other purposes.
    It is strongly recommended that this data is directly acquired
    from the distributor described above and not indirectly
    through other sources which may have changed the data in some
    way.
  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name: ARCE (Arc/Info export)
        Format_Version_Number: 7.0.4
        Format_Version_Date: 1995
        File_Decompression_Technique: Export file was created using defaults, no
compression
      Digital_Transfer_Option:
        Online_Option:
          Computer_Contact_Information:
            Network_Address:
              Network_Resource_Name: ftp.sdvc.uwyo.edu or
http://www.sdvc.uwyo.edu/clearinghouse
          Access_Instructions:
            The data can be accessed online two different way:
            by anonymous ftp or by the world wide web.
            The anonymous ftp server is ftp.sdvc.uwyo.edu,
            and the data is stored in the /pub/gis directory.
```

The WWW page is http://www.sdvc.uwyo.edu/clearinghouse.
Instructions are provided on-line for downloading and
importing the data.
Online_Computer_and_Operating_System:
Both the ftp and WWW server which this data is available
from is a Silicon Graphics Challenge server, running
the IRIX 6.2 UNIX operating system.
Fees: No fees are required for downloading the data that is on-line.

Metadata_Reference_Information:
Metadata_Date: 199808
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Margo Herdendorf
Contact_Address:
Address_Type: mailing address
Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2751
Contact_Electronic_Mail_Address: meh@uwyo.edu
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 19940608

APPENDIX B-3

METADATA - AQUIFER SENSITIVITY

Aquifer Sensitivity of Wyoming at 1:100,000-Scale

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Wyoming Water Resources Center
Publication_Date: 1998
Title: Aquifer Sensitivity of Wyoming at 1:100,000-Scale
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Laramie, Wyoming
Publisher: UW Spatial Data and Visualization Center
Description:
Abstract:

Purpose:
The purpose of this data layer is to provide citizens of Wyoming with an overview of the relative sensitivity of their surficial aquifers to contaminants applied on or near the land surface. It is intended as a regional planning and educational tool.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1998
Currentness_Reference: publication date

Status:

Progress: complete
Maintenance_and_Update_Frequency: to be updated as new data becomes available

---

Keywords:

Theme:
Theme_Keyword: Aquifer Sensitivity
Theme_Keyword: Ground Water Vulnerability
Theme_Keyword: aquifer pollution
Theme:
Theme_Keyword_Thesaurus: none
Place:
Place_Keyword: Wyoming
Place:
Place_Keyword_Thesaurus: none

Access_Constraints:

May not be downloaded without also downloading the Ground Water Vulnerability Assessment Handbook: Volume 1.

Use_Constraints:

This data should not be used for analysis without first reading the Wyoming Ground Water Vulnerability Assessment Handbook described above. This data should not be used for analysis at a scale larger than 1:100,000. Because updates to this dataset or the attached metadata will occur without notice, this dataset may not be redistributed or repackaged in any form without the express written consent of the University of Wyoming Spatial Data and Visualization Center. Instead it is recommended that additional users download the most current version of the data from <http://www.sdvc.uwyo.edu/clearinghouse.>

Point_of_Contact:

Contact_Information:
Contact_Person_Primary:
Contact_Person: Chris Arneson
Contact_Organization: Spatial Data and Visualization Center
Contact_Address:
Address_Type: mailing address
Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2532
Contact_Electronic_Mail_Address: `n/a`

Hours_of_Service: 8:00 - 5:00 MST

Data_Set_Credit:

Native_Data_Set_Environment:
This dataset is a raster layer created using ARC/INFO GRID version 7.1.2 on a SUN Microsystems UNIX computer.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: see Ground Water Vulnerability Assessment Handbook
Quantitative_Attribute_Accuracy_Assessment:
Attribute_Accuracy_Value:
Attribute_Accuracy_Explanation: see Ground Water Vulnerability Assessment Handbook
Logical_Consistency_Report: does not apply for raster data
Completeness_Report: All cells within the State of Wyoming are attributed.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: see Ground Water Vulnerability Assessment Handbook
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Title:
Originator:
Publication_Date:
Source_Scale_Denominator:
Type_of_Source_Media:
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date:
Source_Currentness_Reference:
Source_Citation_Abbreviation: -
Source_Contribution:
Process_Step:
Process_Description: see Ground Water Vulnerability Assessment Handbook
Process_Date:

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:

Distribution_Information:

Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: SDVC Technical coordinator
Contact_Organization: UW Spatial Data and Visualization Center
Contact_Address:
Address_Type: mailing address
Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Country: USA
Postal_Code: 82071
Contact_Voice_Telephone: 307-766-2532
Contact_Electronic_Mail_Address: `n/a`
Distribution_Liability:
The distributor shall not be held liable for improper or incorrect use of this data, based on the description of appropriate/inappropriate used described in this metadata document. The distributor makes no claims for the data's suitability for other purposes. It is strongly recommended that this data is directly acquired from the distributor described above and not indirectly through other sources which may have changed the data in some way.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ARCE (Arc/Info export)
Format_Version_Number: 7.0.4
Format_Version_Date: 1995
File_Decompression_Technique: Export file was created using defaults, no compression
Transfer_Size: XX megabytes
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: `ftp.sdvc.uwyo.edu or`
`<http://www.sdvc.uwyo.edu/clearinghouse>`
Access_Instructions:
The data can be accessed online two different way: by anonymous ftp or by the world wide web. The anonymous ftp server is ftp.sdvc.uwyo.edu, and the data is stored in the /pub/gis directory. The WWW page is <http://www.sdvc.uwyo.edu/clearinghouse.> Instructions are provided on-line for downloading and importing the data.
Online_Computer_and_Operating_System:

Both the ftp and WWW server which this data is available from is a Silicon Graphics Challenge server, running the IRIX 6.2 UNIX operating system.
Fees:
No fees are required for downloading the data that is on-line. Some fees may be required to cover costs of tapes if data is required on tape media.

Metadata_Reference_Information:
Metadata_Date: 19980227
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Margo Herdendorf
Contact_Address:
Address_Type: mailing address
Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2532
Contact_Electronic_Mail_Address: meh@uwyo.edu
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

Generated by mp version 2.4.13 on Wed Sep 1 10:46:15 1999

APPENDIX B-4

METADATA - BEDROCK GEOLOGY

Bedrock Geology of Wyoming

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: 1994
      Title: Bedrock Geology of Wyoming
      Publication_Information:
        Publication_Place: Denver, CO
        Publisher: U.S. Geological Survey
      Online_Linkage: <URL:http://www.sdvc.uwyo.edu/24k/geol.html>geology
  Description:
    Abstract:
      The geologic map was digitized from original scribe sheets used to
      prepare the published Geologic Map of Wyoming (Love and Christiansen,
      1985), consequently at a 1:500,000 scale. Stable base contact prints of
      the scribe sheets were scannned on a Tektronix 4991 digital scanner.
      The scanner automatically converts the scanned image to an ASCII vector
      format. These vectors were transferred to a VAX minicomputer, where they
      were loaded into Arc/Info. The dataset includes both linear and polygon
      features, with attributes derived from the original 1985 map.
    Purpose:
      This geologic map was prepared as part of a study of digital
      methods and techniques as applied to complex geologic maps.

  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 1985
    Currentness_Reference: date of publication

  Status:
    Progress: complete
    Maintenance_and_Update_Frequency: none

  Keywords:
    Theme:
      Theme_Keyword: geology
      Theme_Keyword: bedrock geology
      Theme_Keyword: small scale
      Theme_Keyword_Thesaurus: none
    Place:
      Place_Keyword: Wyoming
      Place_Keyword: State
      Place_Keyword_Thesaurus: none

  Spatial_Domain:
      Bounding_Coordinates:
        West_Bounding_Coordinate: -111.36
        East_Bounding_Coordinate: -104
        North_Bounding_Coordinate: 45.0
        South_Bounding_Coordinate: 41.0

  Browse_Graphic:
```

```
      Browse_graphic_file_name:
<URL:http://www.sdvc.uwyo.edu/24k/geol/wygeol.gif>
      Browse_graphic_file_description: Bedrock geology
      Browse_graphic_file_type: gif

  Access_Constraints: none

  Use_Constraints: scale is 1:500,000 and should not be used outside that range

  Point_of_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Gregory N. Green and Patricia H. Drouillard
        Contact_Organization: U.S. Geological Survey
      Contact_Address:
        Address_Type: mailing address
        Address: Box 25046 Mail Stop 905
        City: Denver
        State_or_Province: Colorado
        Postal_Code: 80225
        Country: USA
      Contact_Voice_Telephone: n/a
      Contact_Electronic_Mail_Address: n/a
      Hours_of_Service:
        n/a

  Data_set_Credit:
    David Love, Anne Coe Christiansen: original scribe sheets.
    Pat Stamile, USGS. Chris Arneson and  Laisan Serebryakov, WWRC.

  Native_Data_Set_Environment:
    The data was created in Arc/Info 5.0.2 software for VMS 5.4-3
    operating system.
    The data is stored in Arc/Info 7.0.4 software for
    Unix operating system.
    The data has been made available in Arc/Info export format
    and ArcView shapefile format, with polygon features.


Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report:
      The accuracy of the attributing is unknown

    Quantitative_Attribute_Accuracy_Assessment:
      Attribute_Accuracy_Value: unknown
      Attribute_Accuracy_Explanation:  none

  Logical_Consistency_Report:
     Polygon topology present and Arc/Info reports matching labels/polygons

  Completeness_Report:
     Unknown, but likely to be as complete in
     attributing as the Love and Christiansen geologic map.

  Positional_Accuracy:
    Horizontal_Positional_Accuracy: n/a
```

```
      Horizontal_Positional_Accuracy_Report:
        The USGS does not have National Mapping Accuracy Standards for
        data produced at the 1:500,000-scale.

  Lineage:
    Source_information:
      Source_Citation:
        Citation_Information:
          Title: geologic scribe sheets
          Originator: Love and Christiansen
          Publication_Date:  1985
      Type_of_Source_Media: stable base contact prints
      Source_Time_Period_of_Content:
        Time_Period_Information:
          Single_Date/Time:
            Calendar_date: unknown
        Source_Currentness_Reference: unknown
      Source_Citation_Abbreviation: scribe sheets
      Source_Contribution: source data
    Process_step:
      Process_Description:
        The geologic map was digitized from scribe sheets used to
        prepare the published Geologic Map of Wyoming (Love and Christiansen,
        1985), consequently at a 1:500,000 scale. Stable base contact prints of
        the scribe sheets were scannned on a Tektronix 4991 digital scanner.
        The scanner automatically converts the scanned image to an ASCII vector
        format. These vectors were transferred to a VAX minicomputer, where they
        were loaded into Arc/Info. The dataset includes both linear and polygon
        features, with attributes derived from the original 1985 map.
      Process_Date: unknown

Spatial_Data_Organization_Information:
 Direct_Spatial_Reference_Method:  Vector

 Point_and_Vector_Object_Information:
  SDTS_Terms_Description:
   SDTS_Point_and_Vector_Object_Type: string
   Point_and_Vector_Object_Count: 60610
   SDTS_Point_and_Vector_Object_Type:  GT-polygon composed of chains
   Point_and_Vector_Object_Count: 22916

Spatial_Reference_Information:
 Horizontal_Coordinate_System_Definition:
    Geographic
      Latitude_Resolution: .001
      Longitude_Resolution: .001
      Geographic_Coordinate_Units:  Decimal Degrees
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name:  GRS1980
      Semi-major_Axis: 6378206.4
      Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:
  Overview_Description:
    Entity_and_Attribute_Overview:
      This dataset has both line (arc) entities and polygon attributes.
```

P1: shorthand attribute
NAME: name
COUNT: number of polygons of each type (name)
DETAIL: detailed description
BW: Line pattern from CARTO.LIN (a linesymbol set in Arc/Info; for use in displaying the map in ArcPLOT)
CCA: Line pattern from CCA.LIN or shade color from CCA.SHD; for use in displaying the map in ArcPlot
DOT: Shade pattern from DOT.SHD (ArcPlot)
PLT: Shade pattern from PLOTTER.SHD (ArcPlot)
MINOR1: DLG3 optional style attribute
MINOR2: DLG3 optional style attribute

Entity_and_Attribute_Detail_Citation:
More information about associated files and attributes are contained in the USGS Open-File 94-0425 accompaning the data set in a text format. These documents can be downloaded via anonymous ftp from a USGS server, greenwood.cr.usgs.gov (137.177.48.5) in a directory named /pub/open-file-reports/ofr-94-0425.

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: GIS lab coordinator
Contact_Organization: Wyoming Water Resources Center
Contact_Address:
Address_Type: mailing address
Address: Box 3067 University Station
City: Laramie
State_or_Province: Wyoming
Country: USA
Postal_Code: 82071
Contact_Voice_Telephone: 307-766-2735
Contact_Electronic_Mail_Address: n/a
Distribution_Liability:
The distributor shall not be held liable for improper or incorrect use of this data, based on the description of appropriate/inappropriate used described in this metadata document.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ARCE (Arc/Info export)
Format_Version_Number: 7.0.4
Format_Version_Date: 1995
File_Decompression_Technique: pkzip
Transfer_size: 34.9
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name:
ftp.sdvc.uwyo.edu or http://www.sdvc.uwyo.edu/clearinghouse
Access_Instructions:
The data can be accessed online two different ways:

by anonymous ftp or by the world wide web.
The anonymous ftp server is ftp.sdvc.uwyo.edu,
and the data is stored in the /pub/gis directory.
The WWW page is http://www.sdvc.uwyo.edu/clearinghouse.
Instructions are provided on-line for downloading and
importing the data.
Online_Computer_and_Operating_System:
Both the ftp and WWW server which this data is available
from is a Silicon Graphics Challenge server, running
the IRIX 6.2 UNIX operating system.
Fees: none for on-line data

Metadata_Reference_Information:
Metadata_Date: 19980123
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Margo Herdendorf
Contact_Address:
Address_Type: mailing address
Address: Box 3067 University Station
City: Laramie
State_or_Province: Wyoming
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2751
Contact_Electronic_Mail_Address: meh@uwyo.edu
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 19940608

APPENDIX B-5

METADATA - CERCLA (SUPERFUND) SITES

U.S. EPA Region 8 TMS-ISP

Metadata for Comprehensive Environmental Response, Compensation, and Liability Information System Locations - Region 8

Table of Contents

Metadata:

Identification_Information

Citation:
Citation_Information:
Originator: US EPA Region 8 TMS-ISP
Publication_Date: 2000
Title: Metadata for Comprehensive Environmental Response, Compensation, and Liability Information System Locations - Region 8
Edition: 1.0
Online_Linkage: WWW.EPA.GOV.
Description:

Abstract:
The Region 8 data are located in the ARC/INFO coverage, R8CER_PTS, which was derived from the Envirofacts point shapefile layer in the National Shapefile Repository. This Repository provides locations of EPA-regulated facilities from the Oracle table LRT_EF_COVERAGE_SRC, which is located within the Locational Reference Tables (LRT) contained in the Envirofacts (EF) Oracle Database. The spatial extent for this point coverage is the conterminous U.S., Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands. The spatial extent for Region 8 is Colorado, Utah, Wyoming, Montana, North Dakota and South Dakota. Facility data from various EPA program system tables were loaded into the LRT_EF_COVERAGE_SRC table. Only coordinate pairs with the highest accuracy values will represent each facility. The Envirofacts point coverage contains data from the following EPA program systems: AIRS/AFS - Aerometric Information Retrieval System (AIRS) Facility Subsystem, BRS - Biennial Reports System, CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System, PCS - Permit Compliance System, RCRIS - Resource Conservation and Recovery Information System and TRIS - Toxic Release Inventory System
Purpose:
The Region 8 ARC/INFO coverage provides Geographic Information System (GIS) applications with a valuable data layer for base mapping of facilities regulated by EPA.
Supplemental_Information:
Intended use of data: The Region 8 ARC/INFO coverage is intended to be used with Environmental Systems Research Institute, Inc. (ESRI) software-based GIS applications that require access to ARC/INFO coverages containing the geographic location of EPA-regulated facilities. References_Cited: " Design of a National Shapefile Repository, " SDC-0055-091-MM-7092, Environmental Protection Agency, September 25, 1998. " System Design for Maps on Demand EnviroMapper Phase 3, " SDC-0055-091-SI-7107, Environmental Protection Agency, September 25, 1998. Envirofacts Environmental Protection Agency website,
< www.epa.gov/enviro/index_java.html >
Envirofacts Environmental Protection Agency website for Locational Reference Tables
< www.epa.gov/enviro/html/fii/fii_geo.html >
This page contains FGDC GEO Profile compliant metadata
Limitations_of_Data:None. Acknowledgement of the U.S. EPA would be appreciated.
Procedures:
The Region 8 ARC/INFO point coverage is created by the following process: The unique identifiers and positional information are extracted from the LRT_EF_COVERAGE_SRC table in the EF Oracle database and transformed into an ARC/INFO point coverage format. The data are then converted to unprojected ArcView Shapefiles using the ARC/INFO command "arcshape" and then inserted into the National Shapefile Repository at the county and state levels

for each state. Local table versions of Region 8 data were produced by creating a database link to enviroep_db and reselecting only Region 8 data from LRT_EF_COVERAGE_SRC, LRT_ADDRESS and LRT_LOC_REF.
Reviews_Applied:
Positional and attribute accuracy are verified by taking independent samples of the data, viewing the data using ArcView, and comparing the displayed data with matching records from Envirofacts. ARC/INFO watch files are created during the extraction of data from the EF Oracle database, processing of the EF data into ARC/INFO point coverages, and conversion from coverages to Shapefiles. These files are created to monitor and verify that the processing occurred without error.
Other_Related_Data_Sets: None.
Notes: None.
Other: None.
Time_Period_of_Content:
Time_Period_Information:
Single_Date_Time:
Calendar_Date: 2000
Multiple_Dates_Times:
Calendar_Date: 1989
Range_of_Dates_Times:
Beginning_Date: 1989
Ending_Date: 2000
Currentness_Reference: December 2000
Status:
Progress: In Work
Maintenance_and_Update_Frequency: Monthly
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -122.7962
East_Bounding_Coordinate: -0.0000
North_Bounding_Coordinate: 0.0000
South_Bounding_Coordinate: 37.1317
Extent: 5724
Data_Set_G-Polygon
Data_Set_G-Polygon_Outer_G-RIng
G-Ring_Latitude:49.1754
G-Ring_Longitude:-115.9884
G-Ring_Latitude:49.9674
G-Ring_Longitude:-95.034
G-Ring_Latitude:48.9674
G-Ring_Longitude:-95.034
G-Ring_Latitude:36.3508
G-Ring_Longitude:-97.1496
G-Ring_Latitude:36.4276
G-Ring_Longitude:-114.309
G-Ring_Latitude:49.1754

G-Ring_Longitude:-115.9884
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Colorado
Theme_Keyword: Montana
Theme_Keyword: North Dakota
Theme_Keyword: South Dakota
Theme_Keyword: Utah
Theme_Keyword: Wyoming
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: National Shapefile Repository
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: US EPA Region 8 TMS-ISP
Contact_Person: Karl Hermann Contact_Position: Regional GIS Coordinator
Contact_Address:
Address_Type: Mailing
Address: 999 18th Street, Suite 300
City: Denver
State_or_Province: Colorado
Postal_Code: 80202
Country: USA
Contact_Voice_Telephone: 303-312-6628
Contact_Facsimile_Telephone: 303-312-7554
Contact_Electronic_Mail_Address: hermann.karl@epa.gov
Hours_of_Service: Monday_Friday 8-4:30, Mountain Time
Browse_Graphic:
Browse_Graphic_File_Name:
Native_Data_Set_Environment:
Arc/Info Version 8.0.2, Solaris Version 7
Pathname = /ndata1/gisdb/r8/r8_pts/r8pcs_pts

Data_Quality_Information:

Logical_Consistency_Report: Point features present.
Completeness_Report: (See Supplemental_Information)
Lineage:
Process_Step:
Process_Description:
The latitude/longitude attribute values that come from the program system databases may or may not be populated.

Process_Date: 2000

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Albers Conical Equal Area
Albers_Conical_Equal_Area:
Standard_Parallel: 38
Standard_Parallel: 48
Longitude_of_Central_Meridian: -106
Latitude_of_Projection_Origin: 37
False_Easting: 0.00000
False_Northing: 0.00000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: .1
Ordinate_Resolution: .1
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6,378,137
Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:

Detailed_Description:
Entity_Type:
Entity_Type_Label: R8CER_PTS.PAT
Entity_Type_Definition: Point attribute table for the R8CER_PTS ARC/INFO points coverage
Entity_Type_Definition_Source: Region 8 GIS Coordinator
Attribute:
Attribute_Label: AREA
Attribute_Definition: ARC/INFO-generated
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:

Attribute_Label: PERIMETER
Attribute_Definition:ARC/INFO-generated
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: R8CER_PTS#
Attribute_Definition:ARC/INFO-generated
Attribute_Definition_Source: Internal feature number
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: R8CER_PTS_ID
Attribute_Definition:User-assigned feature number
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: R8_ID
Attribute_Definition: Unique identifier
Attribute_Definition_Source: Region 8 GIS Coordinator
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 6
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_ACRNM
Attribute_Definition: System acronym for source of record
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Program System Abbreviated Name.
Attribute_Domain_Values:

Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LDIP_CODE
Attribute_Definition: System code for source of record
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_ID
Attribute_Definition: Unique ID from respective program system
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Program System Identification Number.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 30
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: FACILITY_NAME
Attribute_Definition: Name of the facility or site
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Facility Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 50
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: FACILITY_UIN
Attribute_Definition: EPA Facility Registry System Unique Identifiers
Attribute_Definition_Source: Envirofacts Development Team, November 1999.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: character ID values

Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: MAD_ID
Attribute_Definition: Assigned sequential reference number
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: numeric
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LATITUDE
Attribute_Definition: Latitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 11
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LONGITUDE
Attribute_Definition: Longitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Longitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_LATITUDE
Attribute_Definition: Latitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 11
Enumerated_Domain_Value_Definition: Floating value

Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_LONGITUDE
Attribute_Definition: Longitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Longitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: SOURCE_ACRNM
Attribute_Definition: Source Acronym name for borrowed coordinate
Attribute_Definition_Source: Envirofacts Development Team, April 1998
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: SOURCE_ID
Attribute_Definition: Source Identification number for borrowed coordinates
Attribute_Definition_Source: Envirofacts Development Team, April 1998
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: BVFLAG
Attribute_Definition: Indicator of most accurate (" Best Value ") location
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 1
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: MAP_SYMBOL_CODE

Attribute_Definition: Map symbolization code representing source of reco
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: DERIVED_FIPS_CODE
Attribute_Definition: State/County FIPS code for facility location
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Table
Attribute:
Attribute_Label: DERIVED_CATUNIT
Attribute_Definition: Hydrologic Unit Code (HUC) for facility location
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 8
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: DERIVED_POSTAL_C
Attribute_Definition: Zip code for facility location
Attribute_Definition_Source: U.S. Postal ZIP Code of physical or nearest location (ZIP, or ZIP+4) of the entity / subentity
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LRT_LOC_REF_ID
Attribute_Definition: A sequential reference number assigned to a latitude and longitude coordinate pair.
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:

Enumerated_Domain_Value: 8
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PRIMARY_NAME
Attribute_Definition: Name of regulated or monitored entity / subentity.
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Facility Name
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 50
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LOCATION_ADDRESS
Attribute_Definition: Street number and address of the entity / subentity.
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Location Address Text.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 50
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: CITY_NAME
Attribute_Definition: City name for the location of the entity / subentity
Attribute_Definition_Source: United States Postal Service, Address Information Products, Technical Guide, October 1996, Data Element: City State Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 30
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: COUNTY_NAME
Attribute_Definition: County name for the location of the entity / subentity
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: County Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 35
Enumerated_Domain_Value_Definition: character ID values

Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: STATE_CODE
Attribute_Definition: U.S. Post Office state abbreviation of the entity / subentity
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: State USPS Code.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: POSTAL_CODE
Attribute_Definition: Zip code for facility location
Attribute_Definition_Source: U.S. Postal ZIP Code of physical or nearest location (ZIP, or ZIP+4) of the entity / subentity
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 14
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: SUB_ID
Attribute_Definition: Identification for the subentity (ie, monitoring station, spill, pip, stacks, or other operable unit)
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 30
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Overview_Description:
Entity_and_Attribute_Overview: See Entity_and_Attribute_Information
Entity_and_Attribute_Detail_Citation: See Entity_and_Attribute_Information

Distribution_Information:

Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: US EPA Region 8 TMS-ISP
Contact_Person: Karl Hermann Contact_Position: Regional GIS Coordinator

Contact_Address:
Address_Type: Mailing
Address: 999 18th Street, Suite 300
City: Denver
State_or_Province: Colorado
Postal_Code: 80202
Country: USA
Contact_Voice_Telephone: 303-312-6628
Contact_Facsimile_Telephone: 303-312-7554
Contact_Electronic_Mail_Address: hermann.karl@epa.gov
Hours_of Service: Monday-Friday 8-4:30, Mountain Time
Resource_Description: Unknown
Distribution_Liability:
Although these data have been processed successfully on a computer system at the Systems Development Center (SDC), no warranty expressed or implied is made by the EPA regarding the utility of the data on any other system, nor shall the act of distribution constitute any such warranty. Users must assume responsibility to determine the usability of this data for their purposes.

Metadata_Reference_Information:

Metadata_Date: December 2000
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: US EPA Region 8 TMS-ISP
Contact_Person: Karl Hermann
Contact_Address:
Address_Type: Mailing
Address: 999 18th Street, Suite 300
City: Denver
State_or_Province: Colorado
Postal_Code: 80202
Country: USA
Contact_Voice_Telephone: 303-312-6628
Contact_Facsimile_Telephone: 303-312-7554
Contact_Electronic_Mail_Address: herman.karl@epa.gov
Hours_of Service: Monday-Friday 8-4:30, Mountain Time
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 200012
Metadata_Security_Information:
Metadata_Security_Classification_System: N/A
Metadata_Security_Classification: N/A

APPENDIX B-6

METADATA - COUNTY BOUNDARIES

Wyoming County Boundaries

```
Entry_ID: (required)
Entry_Title: Wyoming County Boundaries
Group: Data_Set_Citation
  Originator(s): Spatial Data and Visualization Center
  Title: Wyoming County Boundaries
  Publication_Date: 1997
  Publication_Place: Laramie, Wyoming
  Publisher: Spatial Data and Visualization Center
  Data_Presentation_Form: map
  URL: <URL:http://www.sdvc.uwyo.edu/clearinghouse/county.html>
End_Group
Keyword: county boundaries
Keyword: 100k
Group: Temporal_Coverage
  Start_date: 1993
  Stop_date: 1993
End_Group
Data_Set_Progress: complete
Group: Spatial_Coverage
  Southernmost_Latitude: 40.94837176
  Northernmost_Latitude: 44.99903411
  Westernmost_Longitude: -111.26477012
  Easternmost_Longitude: -103.83670034
End_Group
Location: Wyoming State
Group: Data_Resolution
  Latitude_Resolution: .001
  Longitude_Resolution: .001
End_Group
  Access_Constraints: none
  Use_Constraints: This dataset was produced with an intended application at the
1:100000 (or smaller) scale.
Originating_Center: (required)
Group: Data_Center
  Data_Center_Name: Spatial Data and Visualization Center
Group: Data_Center_Contact
  Last_name: Manager
  First_name: Data
  Email: n/a
  Phone: 307-766-2735
  Group: Address
    Box 4008 University Station
    Laramie, Wyoming 82071
    USA
  End_Group
End_Group
End_Group
  Storage_Medium: The data was created in and is stored in Arc/Info 7.0.4
software for Unix operating system. The dataset is a vector coverage with
polygon topology and is distributed in Arc Export (e00) format.
Group: Distribution
  Distribution_Media: online
  Distribution_Format : ARCE (Arc/Info export)
```

Fees: No fees are required for downloading the data that is on-line. Some fees may be required to cover costs of tapes if data is required on tape media.
End_Group
Group: Multimedia_Sample
URL: <URL:http://www.sdvc.uwyo.edu/images/counties.gif>counties.gif
Format: gif
Caption: Wyoming counties
End_Group
Group: Reference
End_Group
Group: Summary
This dataset was developed for the purpose of displaying 1:100,000-scale counties, also it has been used for clipping other data layers to specific counties.

This dataset contains information on the county boundaries and names for Wyoming mapped at a 1:100,000 scale.

End_Group
Group: DIF_Author
Last_name: Berendsen
First_name: Margo
Email: meh@uwyo.edu
Phone: 307-766-2751
Group: Address
Box 4008 University Station
Laramie, Wyoming 82071
USA
End_Group
End_Group
DIF_Revision_Date: 19970410
Science_Review_Date:

APPENDIX B-7

METADATA - HYDROGRAPHY

1:100,000-Scale Hydrography for Wyoming

```
Entry_ID: (required)
Entry_Title: 1:100,000-scale Hydrography for Wyoming (enhanced DLGs)
Group: Data_Set_Citation
  Originator(s): Wyoming Gap Analysis
  Title: 1:100,000-scale Hydrography for Wyoming (enhanced DLGs)
  Publication_Date: 1996
  Publication_Place: Laramie, Wyoming
  Publisher: Spatial Data and Visualization Center
  Data_Presentation_Form: map
  URL: <URL:http://www.sdvc.uwyo.edu/24k/hydro100.html>
End_Group
Keyword: hydrography
Keyword: streams
Keyword: lakes
Keyword: water features
Keyword: stream order
Keyword: digital line graphs
Group: Temporal_Coverage
  Start_date: unknown
  Stop_date: unknown
End_Group
Data_Set_Progress: complete
Group: Spatial_Coverage
  Southernmost_Latitude: 40.94479444
  Northernmost_Latitude: 44.99390988
  Westernmost_Longitude: -111.36554566
  Easternmost_Longitude: -103.78380412
End_Group
Location: Wyoming
Location: Albany county
Location: Big Horn county
Location: Laramie county
Location: Johnson county
Location: Natrona county
Location: Uinta county
Location: Sweetwater county
Location: Campbell county
Location: Teton county
Location: Crook county
Location: Weston county
Location: Albany county
Location: Converse county
Location: Park county
Location: Hot Springs county
Location: Carbon county
Location: Sublette county
Location: Niobrara county
Location: Lincoln county
Location: Fremont county
Location: Sheridan county
Location: Platte county
Location: Washakie county
Group: Data_Resolution
```

  Latitude_Resolution: .001
  Longitude_Resolution: .001
End_Group
  Access_Constraints: none
  Use_Constraints: Wyoming only. This data should never be used a scale larger than 1:100,000. The data is only as accurate as the source maps it was produced from, and use is dependent on the date of the sources and quality at which they were produced.
Originating_Center: (required)
Group: Data_Center
  Data_Center_Name: Spatial Data and Visualization Center
Group: Data_Center_Contact
  Last_name: Manager
  First_name: Data
  Email: n/a
  Phone: 307-766-2751
  Group: Address
    Box 4008 University Station
    Laramie, Wyoming 82071
    USA
  End_Group
End_Group
End_Group
  Storage_Medium: The data was created in and is stored in Arc/Info 7.0.4 software for Unix operating system. This dataset has both line (stream network) and polygon (lakes/reservoirs) topology. The dataset is served from the SDVC clearinghouse both in an entire statewide dataset and also tiled by 1:100,000 quadrangles, in Arc Export (e00) format and ArcView shapefile format. Statewide and tiled data: there is one export file, which when imported into ARC/INFO, will contain one coverage with both polygon (lakes, reservoirs) and line (streams) topology and two feature attribute files (.PAT and .AAT) along with three additional attribute files containing descriptive information. In shapefile format, there will be two shapefiles (polygons and lines separated), with all attribute files in Dbase format.
Group: Distribution
  Distribution_Media: online
  Distribution_Format : ARCE (Arc/Info export)
  Distribution_Size: 70.9
  Fees: No fees are required for downloading the data that is on-line. Some fees may be required to cover costs of tapes if data is required on tape media.
End_Group
Group: Multimedia_Sample
  URL: <URL:http://www.sdvc.uwyo.edu/images/hydro.gif>hydro.gif
  Format: gif
  Caption: example of perennial and intermittent hydrography
End_Group
Group: Reference
End_Group
Group: Summary
  The purpose of this data layer was to provide a base layer of water features at a statewide level for riparian/aquatic species distribution modeling for the Wyoming Gap Analysis project. However the data may also be used for a variety of other natural resources management/biological studies at the appropriate scale.

  Hydrographic features for Wyoming at 1:100,000-scale, including perennial

and intermittent designations and Strahler stream order attributes for streams. Does not include man-made ditches, canals and aqueducts. The data was originally produced by USGS, a Digital Line Graph (DLG) product, though this product was enhanced (edgematched, some linework and attributes corrected, stream order attribute added).

A subset of this dataset is also available for distribution, including only major streams (order 4 to 7) and major lakes and reservoirs. In order to reduce the size of this subset, the line segments were dissolved to remove unncessary segments.

Both datasets are available in Arc export file and shapefile format for download (see Onlink_Linkage)

Statewide and tiled data: there is one export file, which when imported into ARC/INFO, will contain one coverage with both polygon (lakes, reservoirs) and line (streams) topology and two feature attribute files (.PAT and .AAT) along with three additional attribute files containing descriptive information. In shapefile format, there will be two shapefiles (polygons and lines separated), with all attribute files in Dbase format.

End_Group

Group: DIF_Author

Last_name: Berendsen
First_name: Margo
Email: meh@uwyo.edu
Phone: 307-766-2751
Group: Address
Box 4008 University Station
Laramie, Wyoming 82071
USA

End_Group

End_Group

DIF_Revision_Date: 199805

Science_Review_Date:

APPENDIX B-8

METADATA - MANAGED LANDS

Land Ownership and Management

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator: Wyoming Gap Analysis
      Publication_Date: 19961201
      Title: Land ownership and management for Wyoming
      Edition: 2
      Geospatial_Data_Presentation_Form: map
      Publication_Information:
        Publication_Place: Laramie, Wyoming
        Publisher: Spatial Data and Visualization Center
      Online_Linkage: <URL:http://www.sdvc.uwyo.edu/clearinghouse/human.html>

  Description:
    Abstract:
      Managed areas in Wyoming, including National Forest, Wilderness, Park
boundaries;
      Wildlife Habitat Management areas; state parks and other managed areas.
      This dataset is a subset of the Wyoming Gap Analysis land ownership and
      management status dataset, developed at 1:100,000 scale for Wyoming.

    Purpose: For visual display and query of managed areas in Wyoming.

  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 1994
    Currentness_Reference: Publication date of sources

  Status:
    Progress: complete
    Maintenance_and_Update_Frequency: none

  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -111.09334522
      East_Bounding_Coordinate: -103.88352708
      North_Bounding_Coordinate: 45.10795123
      South_Bounding_Coordinate: 40.95004394

  Keywords:
    Theme:
      Theme_Keyword_Thesaurus: none
      Theme_Keyword: land management
      Theme_Keyword: national parks
      Theme_Keyword: national forests
      Theme_Keyword: state parks
      Theme_Keyword: state wildlife habitat areas
      Theme_Keyword: national recreation areas
      Theme_Keyword: national monuments
      Theme_Keyword: national wildlife refuges
    Place:
      Place_Keyword_Thesaurus: none
```

```
      Place_Keyword: Wyoming

  Access_Constraints: None.

  Use_Constraints:
    This dataset can be used appropriately for coarse-scale
    (> 1:100,000) applications, or to provide context for finer-level maps
    or applications.

  Point_of_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Data Manager
        Contact_Organization: Spatial Data and Visualization Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 4008 University Station
        City: Laramie
        State_or_Province: Wyoming
        Country: USA
        Postal_Code: 82071
      Contact_Voice_Telephone: 307-766-2735
      Contact_Electronic_Mail_Address: n/a
      Hours_of_Service: 8 AM to 5 PM MST

  Browse_Graphic:
    Browse_Graphic_File_Name: <url:http://www.sdvc.uwyo.edu/images/managed.gif>
    Browse_Graphic_File_Description: managed areas in Wyoming
    Browse_Graphic_File_Type: gif

  Native_Data_Set_Environment:
    The data was created in and is stored in Arc/Info 7.0.4 software for
    Unix operating system. Arc/Info stores this vector polygon coverage
    in a directory by the  name, landcov, and also in an associated INFO
    database directory.

Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report:
      Managed area names have been checked with 100% accuracy. Accuracy
      reviews have not been applied to other attributes.

    Quantitative_Attribute_Accuracy_Assessment:
      Attribute_Accuracy_Value: unknown
      Attribute_Accuracy_Explanation: see above

  Logical_Consistency_Report:
    All  polygons are closed and adjacent polygons do not have identical
    attributes. Each polygon has one and only one attribute.

  Completeness_Report: Complete for the state according to the specified
categories and last update.

  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
        Accuracy varies according to the source scale and procedures used
```

to digitize the boundaries. See Process Steps for more detail.

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bureau of Land Management
Publication_Date: 1974-1991
Title: BLM Surface Management Status Maps
Type_of_Source_Media: paper maps
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1974
Ending_Date: 1991
Source_Currentness_Reference: date of publication
Source_Scale_Denominator: 100000
Source_Citation_Abbreviation: BLM maps
Source_Contribution: source of national and state park boundaries
Source_Information:
Source_Citation:
Citation_Information:
Originator: Wyoming Game and Fish Department
Publication_Date: unknown
Title: Wildlife Habitat Management Areas
Type_of_Source_Media: paper maps
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: unknown
Source_Currentness_Reference: publication date
Source_Scale_Denominator: 24000
Source_Citation_Abbreviation: SMA
Source_Contribution: Source of boundary information for Wildlife Habitat
Managed Areas
Source_Information:
Source_Citation:
Citation_Information:
Originator: US Forest Service
Publication_Date: unknown
Title: USFS Management Area and stand maps
Type_of_Source_Media: paper maps
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: unknown
Source_Currentness_Reference: publication date
Source_Scale_Denominator: 126720
Source_Citation_Abbreviation: SMA
Source_Contribution:
Source of boundaries for USFS special interest areas
and research natural areas
Source_Information:
Source_Citation:
Citation_Information:
Originator: Shoshone National Forest
Publication_Date: unknown

Title: digital maps of USFS managed areas
Type_of_Source_Media: digital maps
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: unknown
Source_Currentness_Reference: digitization date
Source_Citation_Abbreviation: SMA
Source_Contribution:
source of boundaries of USFS special interest areas and
research natural areas
Source_Information:
Source_Citation:
Citation_Information:
Originator: National Ecology Research Center
Publication_Date: unknown
Title: digital maps of managed areas
Type_of_Source_Media: SMA
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: unknown
Source_Currentness_Reference: digitization date
Source_Citation_Abbreviation: SMA
Source_Contribution: source of boundaries for various special managed areas
Process_Description:
Source maps for SMAs were either digitized, or if already in digital form, edited to match existing digital ownership and management information.
Twelve different procedures were used to incorporate the managed area data.

1. Boundaries for the selected SMA were digitized directly from 1:100,000 scale Surface Management Status Maps published by the Bureau of Land Management.

2. Boundaries for the selected SMA were manually transcribed from a 1:126,720 scale USFS Management Area Map to the corresponding 1:100,000 scale BLM Surface Management Status Map and digitized.

3. Boundaries for the selected SMA were digitized from a paper overlay that had been manually traced from a USFS 1:24,000 scale stand management map.

4. Boundaries for the selected SMA were digitized directly from 1:24,000 scale blue line reproductions of Wildlife Habitat Management Unit (WHMA) maps developed by the Wyoming Game and Fish Department in Cheyenne, Wyoming.

5. Boundaries for the selected SMA were derived from 1:24,000 scale blue line reproductions of Wildlife Habitat Management AREA (WHMA) maps developed by the Wyoming Game and Fish Department in Cheyenne, Wyoming. The reproduced maps did not contain control points (points of known latitude-longitude) and could not be registered for digitizing. Also, the WHMA boundary was

considered to be irregular or non-linear, such as boundaries following rivers. Transcribing irregular boundaries would have introduced considerable positional inaccuracies. Therefore, a data-capture method was developed which consisted of several steps. First, the WHMA boundary was digitized from the blue line map using digitizer units (inches). Second, the digitized boundary was converted to raster format. Third, the rasterized boundary was matched up with the corresponding area within the vector landstat layer and points common to both the rasterized boundary and the landstat layer were identified. Fourth, the CONTROLPOINTS routine within ARC/INFO was used to link common points between the WHMA raster and the vector landstat layer (note: the number of common points varied with WHMA - see blue line map for the number of control points used). Fifth, the WHMA raster was "rubbersheeted" to fit the landstat layer using the ARC/INFO GRIDWARP command. Sixth, the warped WHMA boundary was converted back into a vector format and incorporated into the landstat layer using the ARC/INFO UNION command. Seventh, sliver polygons were removed.

6. Boundaries for the selected SMA were derived from 1:24,000 scale blue line reproductions of Wildlife Habitat Management Unit (WHMA) maps developed by the Wyoming Game and Fish Department in Cheyenne, Wyoming. If the boundary of the SMA consisted of polygons already within the landstat layer, then the SMA was not digitized from the 1:24,000 scale blue-line maps. Instead, the existing landstat polygons were verified using the blue-line maps to ensure correct boundary locations and attributed with the SMA code. The positional accuracy of the WHMA boundaries taken from the landstat layer is recorded as FAIR.as the WHMA boundary was linear in nature, then the WHMA boundary was transcribed onto the corresponding BLM map and digitized. WHMA boundaries done in this manner were adjusted to fit existing linework in the landstat layer. The positional accuracy of the WHMA boundaries taken from the landstat layer is recorded as POOR.
7. Boundaries for the selected SMA were manually transcribed from a small scale map provided in the Resource Management Plan to the corresponding 1:100,000 scale BLM Surface Management Status Maps and digitized.

8. Boundaries for the selected SMA were given to WY-GAP from the Shoshone National Forest of the USFS. The SMA boundary was digitized at the Shoshone Supervisor's Office using 1:24,000 scale base maps.

9. Boundaries for the selected SMA were given to WY-GAP from the National Ecology Research Center (NERC). The SMA boundary was digitized at the NERC Office using 1:24,000 scale base maps.

10. Boundaries for the selected SMA were digitized directly from a map sent by the resource manager that was not included in the resource management document.

11. Boundaries for the selected SMA were derived from a map sent by the resource manager that was not included in the resource management document. The SMA boundary was transcribed to the corresponding 1:100,000 scale BLM Surface Management Status Map

and digitized.

12. Boundaries for the selected SMA were derived from USPLS legal descriptions listed in the resource management document.
Source_Used_Citation_Abbreviation: SMA
Process_Date: 1991-1994.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: .001
Longitude_Resolution: .001
Geographic_Coordinate_Units: Decimal Degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: GRS1980
Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
The main attribute file contains these attributes:

>SMANAME: Primary special managed area
>SMANAME2: Where two special managed areas overlap, this identifies
> the secondary code of the overlapping area

When a code for the attribute SMA2 exists (not zero), it means that the special managed area identified by the code overlaps another special managed area identified by the SMA1 code. The managing agency coded by SMA1 has primary jurisdiction over the land (there are two instances: Wind River Indian Reservation (SMA2) with Wyoming Game and Fish Dept.'s Spence/Moriarity WHMA (SMA1), and the Bighorn National Recreation Area (SMA2) with Yellowtail WHMA (SMA1),

>SMATYPE: Type of managed area (e.g., national park, national forest).
>DIGCODE: Code describing the method of digitizing the managed area
> (see the process description section in this metadata file for explanation)
>POS_ACC: Positional accuracy of the digitized boundaries of the managed area,
> based on quality of source information. Good, Fair, Poor. See the
> landown metadata file for more detail about these categorizations.
>DIGSOURCE: description of source of digital data.
>FILENOTE: source map for the managed area.
>ACRES: Total acres of the managed area.
>COMMENTS: comments associated with the managed area source
>FSNAME: National Forest name

Entity_and_Attribute_Detail_Citation: n/a

Distribution_Information:

```
  Distributor:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: data manager
        Contact_Organization: Spatial Data and Visualization Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 4008 University Station
        City: Laramie
        State_or_Province: Wyoming
        Country: USA
        Postal_Code: 82071
      Contact_Voice_Telephone: 307-766-2751
      Contact_Electronic_Mail_Address: n/a
  Distribution_Liability:
    The distributor shall not be held liable for improper or
    incorrect use of this data, based on the description of
    appropriate/inappropriate used described in this metadata
    document.
    It is strongly recommended that this data is directly acquired
    from the distributor described above or from another
    U.S.G.S. Biological Resource Division server and not indirectly
    through other sources which may have changed the data in some
    way.
  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name: ARCE (Arc/Info export)
        Format_Version_Number: 7.0.4
        Format_Version_Date: 1995
        File_Decompression_Technique: Export file was created using defaults, no
compression
      Digital_Transfer_Option:
        Online_Option:
          Computer_Contact_Information:
            Network_Address:
              Network_Resource_Name:
                ftp.sdvc.uwyo.edu or
                http://www.sdvc.uwyo.edu/clearinghouse
          Access_Instructions: http://www.sdvc.uwyo.edu/clearinghouse/howto.html
          Online_Computer_and_Operating_System:
            Both the ftp and WWW server which this data is available
            from is a Silicon Graphics Challenge server, running
            the IRIX 6.2 UNIX operating system.
    Fees:
      No fees for downloading the data that is on-line. Some fees may be
required
      to cover cost of tapes if data is required on tape media.

Metadata_Reference_Information:
  Metadata_Date: 199806
  Metadata_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Margo Berendsen
      Contact_Address:
        Address_Type: mailing address
```

Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2751
Contact_Electronic_Mail_Address: meh@uwyo.edu
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

APPENDIX B-9

METADATA - MINE PERMIT BOUNDARIES

DEQ Mine Permit Boundaries

Table of Contents

IDENTIFICATION_INFORMATION

Citation:
Citation_Information:
Originator: Ad Valorem GIS and Ag.
Publication_Date: 20011231
Title: DEQ Mine Permit Boundaries
Edition: one
Geospatial_Data_Presentation_Form: Map
Publication_Information:
Publication_Place: Wyoming Depatment of Revenue 122 W. 25th St. Cheyenne, WY 82002
Publisher: Wyoming Department of Revenue ; Ad Valorem GIS and Ag. Section
Other_Citation_Details:
Online_Linkage: HTTP://revenue.state.wy.us
Larger_Work_Citation:
Citation_Information:
Originator: Wyoming Department of Revenue
Publication_Date: 20011231
Title: DEQ Mine Permit Boundaries
Publication_Information:
Publication_Place: Cheyenne, Wyoming
Publisher: Wyoming Department of Revenue
Online_Linkage: HTTP://revenue.state.wy.us
Description:
Abstract:
The mine permit boundary coverage was created for locational purposes and to aid counties in tax district assessment.
Purpose:
The mine permit boundaries coverage is intended to help with tax
assessment and mine permit location identifications.
Supplemental_Information:

This was produced in cooperation with the Department of Environmental Quality. This data was created for agency management, analysis, and research. It is not intended for legal use.

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 12312000
Ending_Date: 12312002
Currentness_Reference: Current
Status:
Progress: Complete
Maintenance_and_Update_Frequency: None planned
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111.3886
East_Bounding_Coordinate: -104.0359
North_Bounding_Coordinate: 45.0519
South_Bounding_Coordinate: 40.8687
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Mines
Theme_Keyword: Permits
Theme_Keyword: Minerals
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Cities
Place_Keyword: Counties
Place_Keyword: United States
Place_Keyword: Wyoming
Access_Constraints:
Use_Constraints:
Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Wyoming Department of Revenue
Contact_Person: David Chapman
Contact_Position: GIS Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: WY
Postal_Code: 82002-0110
Country: USA
Contact_Voice_Telephone: 307-777-5289
Contact_Facsimile_Telephone: 307-777-7722
Contact_Electronic_Mail_Address: dchapm1@state.wy.us
Hours_of_Service: M-F 8 to 5
Native_Data_Set_Environment:
ArcView version 3.2 shapefile format
m:\statedata\mines\stadeqmindd_4.shp

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DATA_QUALITY_INFORMATION

Attribute_Accuracy:
Attribute_Accuracy_Report:
Attribute accuracy is as accurate as our PLSS at 1:24000. Attributes were compared to aerial photos of mines in operation.
Logical_Consistency_Report:
All data is consistent with the PLSS as automated techniques were used. Automation is based on a fully attributed base map of the PLSS. All polygons are complete, closed and attributed. Some overlaping polygons may exist do to human error in reporting the aliquot parts. Ongoing review is being done by the Wyoming Dept. of Environmental Quality.
Completeness_Report:
The data is as complete as the records of the Department of Environmental Quality's records. To the best of our knowledge the records are complete. Small permitted areas encompasing roads, railroads, transmission lines, and piplines were ommitted.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
Most data was created using USGS 7.5 minute Topographic Maps at 1:24000 scale, registered by Arc View and projected in a consistent manner.Therefore, the horizontal accuracy is assumed to be within National Map Accuracy Standards.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report:
Most data was delineated off of USGS 7.5 minute Topographic Maps at 1:24000 scale, registered by Arc View, and projected in a consistent manner. Therefore, the vertical accuracy is assumed to be within National Map Accuracy Standards.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: Ad Valorem GIS and Ag.
Publication_Date: 20011231
Title: DEQ Mine Permit Boundaries
Edition: one
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Wyoming Depatment of Revenue 122 W. 25th St. Cheyenne, WY 82002
Publisher: Wyoming Department of Revenue ; Ad Valorem GIS and Ag. Section
Other_Citation_Details:
Online_Linkage: HTTP://revenue.state.wy.us

Larger_Work_Citation:
Citation_Information:
Originator: Wyoming Department of Revenue
Publication_Date: 20011231
Title: DEQ Mine Permit Boundaries
Publication_Information:
Publication_Place: Cheyenne, Wyoming
Publisher: Wyoming Department of Revenue
Online_Linkage: HTTP://revenue.state.wy.us
Source_Scale_Denominator: 1:24000
Type_of_Source_Media: Map
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20011231
Ending_Date: 20021231
Source_Currentness_Reference: Current
Source_Citation_Abbreviation:
Source_Contribution:
Source_Information:
Source_Citation:
Citation_Information:
Originator: Ad Valorem GIS and Ag.
Publication_Date: 20011231
Title: DEQ Mine Permit Boundaries
Edition: one
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Wyoming Depatment of Revenue 122 W. 25th St. Cheyenne, WY 82002
Publisher: Wyoming Department of Revenue ; Ad Valorem GIS and Ag. Section
Other_Citation_Details:
Online_Linkage: HTTP://revenue.state.wy.us
Larger_Work_Citation:
Citation_Information:
Originator: Wyoming Department of Revenue
Publication_Date: 20011231
Title: DEQ Mine Permit Boundaries
Publication_Information:
Publication_Place: Cheyenne, Wyoming
Publisher: Wyoming Department of Revenue
Online_Linkage: HTTP://revenue.state.wy.us
Source_Scale_Denominator: 1
Type_of_Source_Media: Map
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20011231
Ending_Date: 20021231
Source_Currentness_Reference: Current
Source_Citation_Abbreviation:
Source_Contribution:
Process_Step:
Process_Description:
Data was obtained fron the Dept. of Environmental Quality. A database containing the fields: meridian, township,

range, section, and aliquot calls(location). Records are cleaned and parsed to run through specially designed software. The software reads the location and then places it on our fully attributed PLSS basemap creating a polygon based on the aliquot call on the PLSS. The polygon is fully attributed. Attributing was done by linking the polygon coverage unique ID field with the same unique ID in our database. Once linked the .shp file was saved with the new attributes.

Source_Used_Citation_Abbreviation:
Process_Date:
Source_Produced_Citation_Abbreviation:
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Organization: Wyoming Department of Revenue
Contact_Person: David Chapman
Contact_Position: GIS Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: WY
Postal_Code: 82002-0110
Country: USA
Contact_Voice_Telephone: 307-777-5289
Contact_Facsimile_Telephone: 307-777-7722
Contact_Electronic_Mail_Address: dchapm1@state.wy.us
Hours_of_Service: M-F 8 to 5

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SPATIAL_DATA_ORGANIZATION_INFORMATION

Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 1963

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SPATIAL_REFERENCE_INFORMATION

Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution:
Longitude_Resolution:
Geographic_Coordinate_Units: Decimal Degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1927
Ellipsoid_Name: Clarke 1866
Semi-major_Axis:
Denominator_of_Flattening_Ratio:

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ENTITY_AND_ATTRIBUTE_INFORMATION

Overview_Description:
Entity_and_Attribute_Overview:
Entity_and_Attribute_Detail_Citation:

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DISTRIBUTION_INFORMATION

Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Wyoming Department of Revenue
Contact_Person: David Chapman
Contact_Position: GIS Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: WY
Postal_Code: 82002-0110
Country: USA
Contact_Voice_Telephone: 307-777-5289
Contact_Facsimile_Telephone: 307-777-7722
Contact_Electronic_Mail_Address: dchapm1@state.wy.us
Hours_of_Service: M-F 8 to 5
Resource_Description:
Distribution_Liability:

This data is not to be used as a legal representation of permitted areas.

Standard_Order_Process:

Non-Digital_Form:

Fees: none

Ordering_Instructions:

Call or e-mail contact person for ordering instructions.

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METADATA_REFERENCE_INFORMATION

Metadata_Date: 20011231

Metadata_Review_Date: 20011231

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Wyoming Department of Revenue

Contact_Person: David Chapman

Contact_Position: GIS Manager

Contact_Address:

Address_Type: Mailing and physical address

Address: 122 W 25th Street

City: Cheyenne

State_or_Province: WY

Postal_Code: 82002-0110

Country: USA

Contact_Voice_Telephone: 307-777-5289

Contact_Facsimile_Telephone: 307-777-7722

Contact_Electronic_Mail_Address: dchapm1@state.wy.us

Hours_of_Service: M-F 8 to 5

Metadata_Standard_Name: FGDC CSDGM

Metadata_Standard_Version: FGDC-STD-001-1998

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APPENDIX B-10

METADATA - PIPELINES

Pipelines

NPMS METADATA - IDENTIFICATION INFORMATION

Identification Information

Citation
Originator: U.S. Department of Transportation / Baker
Publication Date: 03/30/1999
Title: National Pipeline Mapping System
Publication Information
Publication Place: Washington, D.C.
Publisher: U.S. Department of Transportation, Office of Pipeline Safety
Online Linkage
www.npms.rspa.dot.gov
Description
Abstract: The U.S. Department of Transportation (USDOT), Research and Special Projects Administration (RSPA), Office of Pipeline Safety (OPS) is working with other federal and state agencies and the pipeline industry to create a National Pipeline Mapping System (NPMS). The NPMS is a full-featured geographic information system (GIS) containing the location and selected attributes of the major natural gas transmission lines and hazardous liquid trunklines, and liquefied natural gas (LNG) facilities operating in the United States and other offshore entities. Michael Baker Jr., Inc. (Baker), as the primary contractor, assumes all responsibility of the NPMS National Repository. Source data is contributed by pipeline operators to the National Repository. This metadata is for the entire national dataset. Additional metadata for individual pipeline systems are also available.

Distribution of NPMS data is handled for the OPS by the NPMS National Repository. Neither the United States Government nor any party involved in the creation and compilation of NPMS data and maps guarantees the accuracy or completeness of the products. NPMS data has a target accuracy of ±500 feet and resides in geographic coordinates. NPMS data must never be used as a substitute for contacting the appropriate local one-call center prior to digging.

Purpose
These data sets are for the purpose of tracking all natural gas transmission pipelines, hazardous liquid trunklines, and LNG facilities in the United States. The data will be used to support the assessment risk associated with the Nation’s liquid and gas pipeline infrastructure.
Time Period of Content
Range of Dates
Beginning Date: 1999
Ending Date: Ongoing
Currentness Reference: Publication date
Status
Progress: In work
Maintenance and Update Frequency: As needed

Spatial Domain
Bounding Coordinates
West Bounding Coordinate: -179.00
East Bounding Coordinate: -66.00

North Bounding Coordinate: 73.00
South Bounding Coordinate: 18.00

Keywords

Theme

Theme Keyword Thesaurus: None
Theme Keyword: LNG Facility
Theme Keyword: Pipeline
Theme Keyword: Oil
Theme Keyword: Gas
Theme Keyword: Natural Gas

Place

Place Keyword Thesaurus: None
Place Keyword: USA
Place Keyword: United States
Place Keyword: Alabama
Place Keyword: Alaska
Place Keyword: Arkansas
Place Keyword: Arizona
Place Keyword: California
Place Keyword: Colorado
Place Keyword: Connecticut
Place Keyword: Delaware
Place Keyword: District of Columbia
Place Keyword: Florida
Place Keyword: Georgia
Place Keyword: Idaho
Place Keyword: Iowa
Place Keyword: Illinois
Place Keyword: Indiana
Place Keyword: Kansas
Place Keyword: Kentucky
Place Keyword: Louisiana
Place Keyword: Maine
Place Keyword: Massachusetts
Place Keyword: Maryland
Place Keyword: Michigan
Place Keyword: Minnesota
Place Keyword: Missouri
Place Keyword: Mississippi
Place Keyword: Montana
Place Keyword: North Carolina
Place Keyword: North Dakota
Place Keyword: Nebraska
Place Keyword: New Hampshire
Place Keyword: New Jersey
Place Keyword: New Mexico
Place Keyword: Nevada
Place Keyword: New York
Place Keyword: Ohio
Place Keyword: Oklahoma
Place Keyword: Oregon
Place Keyword: Pennsylvania
Place Keyword: Rhode Island
Place Keyword: South Carolina
Place Keyword: South Dakota
Place Keyword: Tennessee
Place Keyword: Texas

Place Keyword: Utah
Place Keyword: Vermont
Place Keyword: Virginia
Place Keyword: Wisconsin
Place Keyword: Washington
Place Keyword: West Virginia
Place Keyword: Wyoming

Access Constraints
Pipeline operators are sent the data they contributed. Other Freedom of Information Act Requests are under consideration by the USDOT.

Use Constraints: Neither the United States Government nor any party involved in the creation and compilation of NPMS data and maps guarantees the accuracy or completeness of the products. NPMS data should be considered no more accurate than ±500 feet and must never be used as a substitute for contacting the appropriate local one-call center prior to digging.

Points of Contact

Contact Organization Primary
Contact Organization: U.S. Department of Transportation
Contact Person: Steven Fischer, RSPA
Contact Position: NPMS Coordinator
Contact Address
Address Type: Mailing and physical address
Address: 400 7th Street, SW
City: Washington
State or Province: D.C.
Postal Code: 20590
Country: USA
Contact Voice Telephone: 202-366-6267
Contact Facsimile Telephone: 202-366-4566
Contact Electronic Mail Address: steven.fischer@rspa.dot.gov
Hours of Service: 8am - 5pm EST

Contact Organization Secondary
Contact Organization: Michael Baker Jr., Inc.
Contact Person: Barney Krucoff
Contact Position: NPMS National Repository Manager
Contact Address
Address Type: Mailing and physical address
Address: 3601 Eisenhower Avenue, Suite 600
City: Alexandria
State or Province: VA
Postal Code: 22304
Country: USA
Contact Voice Telephone: 703-960-8800
Contact Facsimile Telephone: 703-960-9125
Contact Electronic Mail Address: npms-nr@mbakercorp.com
Hours of Service: 8am - 5pm EST

Data Quality Information

Attribute Accuracy
Attribute Accuracy Report: The NPMS repository checks all entities and their attribute data for compliance with NPMS data standards. These checks do not

ensure that NPMS data accurately reflects conditions in the field - only that the attributes meet database design specifications.
Logical Consistency Report: The National Repository is responsible for ensuring 1) that all geospatial data sets are complete and correctly projected to the proper geodetic datum, and 2) that the attribute data sets are compliant with the NPMS data standards. Operator contributions may vary in many respects; therefore, logical consistency of NPMS data cannot be guaranteed.
Completeness Report: The repository verifies each submitted data set for completeness according to NPMS standards. The repository checks to ensure that all submissions include the geospatial and attribute data, and metadata. Pipeline systems that have not been submitted by their operators are not included.

Positional Accuracy
Horizontal Positional Accuracy
Horizontal Positional Accuracy Value: ±500
Horizontal Positional Accuracy Explanation: Positional accuracy of ±500 feet has been attempted for all pipelines and LNG facilities. Actual positional accuracy depends on the spatial accuracy of the pipeline operator's submission. Thus, actual positional accuracy of NPMS data varies. Positional accuracy is indicated in the QUALITY_CD field found in both the pipeline and LNG facility attribute tables. Positional accuracy is designated as E, V, G, P, or U where E = Excellent, within 50 feet; V = Very Good, 50-300 feet; G = Good, 301-500 feet; P = Poor, 501-1000 feet; and U = Unknown.

Source Information
Source Citation
Originator: Various pipeline operators
Publication Date: Various
Title: Various
Edition: Various
Publication Information
Publication Place: Conterminous United States
Publisher: Various pipeline operators
Online Linkage: www.npms.rspa.dot.gov
Source Scale Denominator: All pipeline and LNG facility data sets submitted to the NPMS by pipeline operators for processing are required to originate from scale sources less than or equal to 1:24000. Metadata for individual pipeline systems indicate Source Scale.
Type of Source Media: The NPMS accepts both digital and hard-copy formats for processing data into the NPMS. Metadata for individual pipeline systems indicate Source Media.
Source Time Period of Content Various
Source Currentness Reference: Publication Date
Source Citation Abbreviation: Various
Source Contribution: Various
Process Step
Process Description: The NPMS data compilation process begins when a pipeline or LNG facility operator submits data to the National Repository. Following are the eight major steps in the process.
Operator Submission. The process start when an operator sends information (termed "submission") to the NPMS repository.
Repository Check-In. The Repository logs submissions, scans digital submissions for viruses, inventories submissions, notifies the operator of submission receipt, and initiates tracking procedures.
Metadata Review and Repair. The metadata file(s) that accompanies a submission is extremely important because it serves as a transmittal form as well as the

metadata. Various NPMS applications, particularly the Geospatial Data Conversion Tool, depend on information from the metadata to complete processing in an automated manner. If problems exist with the metadata, the repository works with the operator to complete the submission. The submission is then routed for the necessary processing.
Hard-Copy and Digital Data Conversion. Submissions with hard-copy geospatial data are separated from submissions with digital geospatial data. Hard-copy submissions are digitized, and digital submissions are translated. Attribute data is matched to the appropriate line features and reviewed for compliance with the standards. At the end of this step, the data is in ArcInfo format and ready for final processing.
Interstate Processing. The National Repository assigns NPMS_SYS_IDs and coordinates interstate edge-matching, completing the final processing.
Quality Assurance and Quality Control. An independent quality control review is performed by the National Repository Quality Control Team.
Operator Check Plot Review. The repository prepares a random selection of check plots for review by the submitting operator. The operator is asked to review and comment on the check plots. The National Repository distributes check plots via FTP.
Incorporation of the Data into the National Database. The approved submission is incorporated into the National Database.

Process Date: Ongoing
Process Contact
Contact Organization Primary
Contact Organization: Michael Baker Jr., Inc.
Contact Person: Ronnie Buzzard
Contact Position: NPMS Project Manager
Contact Address
Address Type: Mailing and physical address
Address: 3601 Eisenhower Avenue, Suite 600
City: Alexandria
State or Province: VA
Postal Code: 22304
Country: USA
Contact Voice Telephone: 703-317-6205
Contact Facsimile Telephone: 703-960-9125
Contact Electronic Mail Address: npms-nr@mbakercorp.com
Hours of Service: 8am - 5pm EST

Spatial Data Organization Information

Indirect Spatial Reference: Conterminous United States
Direct Spatial Reference Method: Vector, Point
Point and Vector Object Information
SDTS Terms Description
SDTS Point and Vector Object Type: Point, Entity Point, Label Point, Node.
Point and Vector Object Count: Changes are ongoing.

Spatial Reference Information

Horizontal Coordinate System Definition
Geographic
Latitude Resolution: 0.000001
Longitude Resolution: 0.000001
Geographic Coordinate Units: Decimal Degrees
Geodetic Model

Horizontal Datum Name: North American Datum 1983 (NAD83)
Ellipsoid Name: Geodetic Reference System 80 (GRS80)
Semi-Major Axis: 6,378,137
Denominator of Flattening Ratio: 298.257

Entity and Attribute Information

Detailed Description
Entity Type
Entity Type Label: Pipeline
Entity Type Definition: Polyline of pipeline segments.
Entity Type Definition Source: Pipeline Segment Attribute Table and Pipeline System

Attribute Table
Attributes
Attribute Label: NPMS_SEG_ID
Attribute Definition: Identifier for the polyline segment. Assigned automatically by ArcInfo when line topology is built.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: 1 - 99999999999
Enumerated Domain Value Definition: Any number 11 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: 1

Attribute Label: NPMS_SYS_ID
Attribute Definition: Unique link between the geospatial elements (lines) and their respective attribute records. Assigned by the National Repository.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: 1 - 99999999
Enumerated Domain Value Definition: Any number eight characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: 1

Attribute Label: SUBSYS_NM
Attribute Definition: A name for a smaller subsection of a pipeline system. A subset of SYS_NM.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text
Enumerated Domain Value Definition: Any string 40 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: PLINE_ID
Attribute Definition: Unique identifier for a specific section of pipeline within a pipeline system.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text

Enumerated Domain Value Definition: Any string 20 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: OPS_ID
Attribute Definition: Accounting number assigned by the OPS to the company that operates the pipeline system.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: 1 - 99999
Enumerated Domain Value Definition: Any number 5 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: 1

Attribute Label: OPER_NM
Attribute Definition: Name of the company that operates the pipeline.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text
Enumerated Domain Value Definition: Any string 40 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: SYS_NM
Attribute Definition: Name for a functional grouping of pipelines.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text
Enumerated Domain Value Definition: Any string 40 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: DIAMETER
Attribute Definition: Nominal diameter of the pipeline segment.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: 01.00 - 99.00
Enumerated Domain Value Definition: Any real 4 characters in length with 2 decimal places.
Attribute Units of Measurement: Inches
Attribute Measurement Resolution: 0.01

Attribute Label: COMMODITY1
Attribute Definition: Abbreviation for the primary commodity carried by the pipeline.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain

Enumerated Domain Value: HG, CRD, LPG, NG, PRD, AA, CO2, NGL, HVL, EMT
Enumerated Domain Value Definition: HG = Hydrogen Gas, CRD = Crude Oil, LPG = Liquid Petroleum Gas, NG = Natural Gas, PRD = Product, AA = Anhydrous Ammonia, CO2 = Carbon Dioxide, NGL = Natural Gas Liquids, HVL = Highly Volatile Liquid,
EMT = Empty
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: COMMODITY2
Attribute Definition: Abbreviation for the secondary commodity carried by the pipeline.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: HG, CRD, LPG, NG, PRD, AA, CO2, NGL, HVL
Enumerated Domain Value Definition: HG = Hydrogen Gas, CRD = Crude Oil, LPG = Liquid Petroleum Gas, NG = Natural Gas, PRD = Product, AA = Anhydrous Ammonia, CO2 = Carbon Dioxide, NGL = Natural Gas Liquids, HVL = Highly Volatile Liquid
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: COMMODITY3
Attribute Definition: Abbreviation for the tertiary commodity carried by the pipeline.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: HG, CRD, LPG, NG, PRD, AA, CO2, NGL, HVL
Enumerated Domain Value Definition: HG = Hydrogen Gas, CRD = Crude Oil, LPG = Liquid Petroleum Gas, NG = Natural Gas, PRD = Product, AA = Anhydrous Ammonia, CO2 = Carbon Dioxide, NGL = Natural Gas Liquids, HVL = Highly Volatile Liquid
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: CMDTY_DESC
Attribute Definition: Descriptive information on the commodities carried by the pipeline system.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text
Enumerated Domain Value Definition: The name of each commodity carried separated by commas, 40 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: INTERSTATE
Attribute Definition: Designator to identify whether the pipeline is an interstate pipeline.
Attribute Definition Source: OPERATOR
Attribute Domain Values

Enumerated Domain
Enumerated Domain Value: N, Y
Enumerated Domain Value Definition: N = No, Y = Yes
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: STATUS_CD
Attribute Definition: Identifies the current status of the pipeline segment.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: I, B, R
Enumerated Domain Value Definition: I = In Service, B = Abandoned, R = Retired
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: QUALITY_CD
Attribute Definition: Operator's estimate of the positional accuracy of the submitted pipeline data.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: E, V, G, P, U
Enumerated Domain Value Definition: E = Excellent, within 50 feet; V = Very Good, 50-300 feet; G = Good, 301-500 feet; P = Poor, 501-1000 feet; U = Unknown
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: REVIS_CD
Attribute Definition: Identifies pipeline as an addition, or a modification to or deletion of a previous submission.
Attribute Definition Source: NPMS/OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: A, M, D
Enumerated Domain Value Definition: A = Addition, M = Modification, D = Deletion
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: METADATA_ID
Attribute Definition: Identifier to link geospatial and metadata tables together.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: 1 - 99999999
Enumerated Domain Value Definition: Any string 12 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: SUBREPOSCD

Attribute Definition: Two-letter code that identifies the National Repository.
Attribute Definition Source: NPMS
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: NR, CA, TX, KS, OK, LA, NJ, PA, MN, KY
Enumerated Domain Value Definition: NR = National Repository.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: LNG_NM
Attribute Definition: LNG facility name.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text
Enumerated Domain Value Definition: Any string 40 characters in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Attribute Label: LNG_ID
Attribute Definition: Identifier for the LNG facility assigned by the operator.
Attribute Definition Source: OPERATOR
Attribute Domain Values
Enumerated Domain
Enumerated Domain Value: Free text
Enumerated Domain Value Definition: Any string 20 character in length.
Attribute Units of Measurement: N/A
Attribute Measurement Resolution: N/A

Distribution Information

Distributor
Contact Organization Primary
Contact Organization: Michael Baker Jr., Inc.
Contact Person: Ronnie Buzzard
Contact Position: NPMS Project Manager
Contact Address
Address Type: Mailing and physical address
Address: 3601 Eisenhower Avenue, Suite 600
City: Alexandria
State or Province: VA
Postal Code: 22304
Country: USA
Contact Voice Telephone: 703-317-6205
Contact Facsimile Telephone: 703-960-9125
Contact Electronic Mail Address: npms-nr@mbakercorp.com
Hours of Service: 8am - 5pm EST
Resource Description: The NPMS contains natural gas transmission lines, hazard liquid trunklines, LNG facilities, and breakout tank farms in the United States. Only those pipelines that have been submitted by facility operators are included in the data set.

Distribution Liability: Use at your own risk. NPMS maps and/or digital data have been compiled by the United States Department of Transportation, Research and Special Programs Administration, Office of Pipeline Safety as part of the National Pipeline Mapping System (NPMS). The data is compiled from contributions made by pipeline and LNG facility operators and is processed by private contractors. Neither the United States Government nor any party involved in the creation and compilation of NPMS data and maps guarantees the accuracy or completeness of the product. NPMS data should be considered no more accurate than ±500 feet and must never be used as a substitute for contacting the appropriate local one-call center prior to digging.
Standard Order Process
Digital Form: Contact the National Repository for available formats and media.
Online Option
Computer Contact Information
Network Address
Network Resource Name: www.npms.rspa.dot.gov

Metadata Reference Information

Metadata Date: 03/12/2003
Metadata Contact
Contact Organization Primary
Contact Organization: Michael Baker Jr., Inc.
Contact Person: Ronnie Buzzard
Contact Position: NPMS Project Manager
Contact Address
Address Type: Mailing and physical address
Address: 3601 Eisenhower Avenue, Suite 600
City: Alexandria
State or Province: VA
Postal Code: 22304
Country: USA
Contact Voice Telephone: 703-317-6205
Contact Facsimile Telephone: 703-960-9125
Contact Electronic Mail Address: npms-nr@mbakercorp.com
Hours of Service: 8am - 5pm EST
Metadata Standard Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata Standard Version: Version 2.0
Metadata Time Convention: Eastern Standard Time (EST)
Metadata Access Constraints: None
Metadata Use Constraints: None

APPENDIX B-11

METADATA - PLSS

Public Land Survey for Wyoming, derived from Bureau of Land Management Geographic Coordinate Database

Available as - [Outline]

Metadata:

Identification_Information:

Citation:
Citation_Information:
Originator: Bureau of Land Management, Wyoming
Publication_Date: 1996
Title:
Public Land Survey for Wyoming, derived from Bureau of Land Management Geographic Coordinate Database
Publication_Information:
Publication_Place: Cheyenne, WY
Publisher: Bureau of Land Management, Wyoming
Online_Linkage: Wyoming BLM GIS web page
Description:
Abstract:
This dataset contains township, range, section and some tract information for all surveyed portions of Wyoming. Most of the data originated from Bureau of Land Management (BLM) GCDB (Geographic Coordinate Data Base) files, generated from legal surveys. The townships that were not collected for the GCDB where created from MOSS (Map Overlay Statistical System) GIS maps. These township where forced to edgematch with surrounding and/or adjacent GCDB data.
Purpose:
To provide base information about Wyoming's public survey system. May be used to locate legal descriptions to the section level.
Time_Period_of_Content:

Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1996
Currentness_Reference: publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: Irregular
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111
East_Bounding_Coordinate: -104
North_Bounding_Coordinate: 45
South_Bounding_Coordinate: 41
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Public Land Survey
Theme_Keyword: PLS
Theme_Keyword: Legal description
Theme_Keyword: Township
Theme_Keyword: Range
Theme_Keyword: Section
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Wyoming
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Larry Neasloney
Contact_Organization: Bureau of Land Management
Contact_Address:
Address_Type: mailing address
Address: 5353 Yellowstone Rd
City: Cheyenne
State_or_Province: Wyoming
Postal_Code: 82003
Country: USA
Contact_Voice_Telephone: 307-775-6171
Contact_Electronic_Mail_Address: n/a
Hours_of_Service: 8:00 - 5:00 MST
Data_Set_Credit: Zach Puls
Native_Data_Set_Environment:
The data was converted from Autocad DXF format and MOSS format to ARC/INFO vector line format on a Unix system.

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report: Not available. Depends on the accuracy of the GCDB.

Logical_Consistency_Report:

Data has been checked for topological consistency. There are no dangling Arcs, unlabeled polygons, or other topological errors.

Completeness_Report:

Portions of the Wyoming have never been surveyed and are not included in this dataset. Level 5 & 6 survey?

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

Generally, the user can assume the accuracy to be not less than 1:24000 or +- 50 ground feet. However,the following paragraph which is taken from the GCDB User's Guide on the Wyoming Geographic Information Advisory Council's GCDB Internet Page addresses limitations of GCDB data. These limitations also apply to the GIS/PLSS data layer.

Wyoming's GCDB data was generated using the most recent official BLM survey records and in some cases private survey records provided by the Forest Service. The quality of these surveys vary widely. Correspondingly, the accuracy of the coordinates generated varies widely. GCDB is designed to maintain the spatial relationships as depicted on our official (legal) records. Any errors in the data are distributed in an unpredictable manner. Given this, the user must be aware that any acreages which this data may allow to be calculated are legally invalid.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Bureau of Land Management, Wyoming

Title: Geographic Coordinate Database (GCDB)

Publication_Date: Publication_Information Publication_Place

Source_Scale_Denominator: 24000

Type_of_Source_Media: digital

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 1990

Ending_Date: 1996

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: GCDB

Source_Contribution: Main source of data

Process_Step:

Process_Description:
This dataset is derived from the GDCB database. The following is an excerpt from the BLM's GCDB User's Manual (contact: Milbert Krohn, 307-775-6225). GCDB is generated from official BLM survey records and control coordinates of varying accuracy. GCDB data includes an estimate of the positional accuracy of the coordinates. This estimate is based on residual errors in adjusting survey data between known coordinates. This data allows the GIS user to determine suitability of the GCDB for various applications. GCDB data collection in Wyoming was initiated in September 1990. At that time, the Public Land Survey System Coordinate Computation Software (PCCS) was used for coordinate generation. In May of 1993, a second, and vastly improved, generation of GCDB software named Geographic Measurement Management (GMM) was released. GCDB is not a legal data base but rather attempts to maintain the spatial relationships as depicted on the legal survey records. The reliability of GCDB coordinates is dependent upon the quality of the data used to generate it which in many cases is poor. Given this, the user should be aware acreages which can be generated from GCDB data rarely reflect the legal acreages from the official survey records and are therefore invalid.
Process_Date: Unknown
Process_Step:
Process_Description:
Most township coverages originated from GCDB(Geographic Coordinate Data Base)files. Some error corrections such as undershoots and overshoots were performed using Autocad. The corrected township dxf files were converted to ARC/INFO coverages using the DXFARC command. No original GCDB point coordinates where moved during this process. The townships that where not collected for the GCDB where created from MOSS(Map Overlay Statistical System)GIS maps. These township were forced to edgematch with surrounding and/or adjacent GCDB coverages. Townships where joined into 100K tiles. Slivers between townships were removed with the ELIMINATE command in ARC/INFO or cartographic license was taken to complete edgematching. Generally points where moved less than 10 ground feet.
Process_Date: 1990-1996

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.01
Longitude_Resolution: 0.01
Geographic_Coordinate_Units: Decimal degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80

Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
Township datasets include these attributes:

```
dxf-text = Township and Range numbers combined (for quick
queries) example: t35r117
township = Township numbers, example: t35n
range = Range Numbers, example: r117w
Meridian = Prime Meridian number, 6 or 111
```

Section datasets include these attributes:

```
dxf-text = section number (1 through 36)
Township = Township Numbers, example: t35n
Range = Range Numbers, example: r117w
Meridian = Prime Meridian number, 6 or 111
County: number 1 through 23
```

Entity_and_Attribute_Detail_Citation: none

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Data Manager
Contact_Organization: Bureau of Land Management, Wyoming
Contact_Address:
Address_Type: mailing address
Address: 5353 Yellowstone
City: Cheyenne
State_or_Province: Wyoming
Country: USA
Postal_Code: 82001
Contact_Voice_Telephone: 307-775-6171
Contact_Electronic_Mail_Address: n/a
Distribution_Liability:
The distributor shall not be held liable for improper or incorrect use of this data, based on the data quality section of this document. It is strongly recommended that this data is directly acquired from the distributor described above and not indirectly through other sources which may have changed the data in some way.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ARCE (Arc/Info export)
Format_Version_Number: 7.0.4
Format_Version_Date: 1995

File_Decompression_Technique: Export file was created using defaults, no compression
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: not available yet
Access_Instructions: n/a
Online_Computer_and_Operating_System: NT
Fees: No fees are required for downloading the data that is on-line.

Metadata_Reference_Information:
Metadata_Date: 20000720
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Margo Berendsen
Contact_Address:
Address_Type: mailing address
Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2751
Contact_Electronic_Mail_Address: meh@uwyo.edu
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

Generated by mp version 2.4.13 on Thu Aug 3 17:03:09 2000

APPENDIX B-12

METADATA - PSOCs - LINES

PSOCs - Lines

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Chris Arneson, Trihydro Corporation
Originator: Kim Parker, WDEQ
Publication_Date: June 2004
Title: psocs_line
Edition: 1.0
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: \\dc1\swap\GIS\GIS2\PSOCs\psocs_line.shp
Description:
Abstract:
Potential Sources of Contamination for Wyoming. This line layer includes pipelines, railroads, and primary highways that may present a potential hazard to public water supplies in Wyoming.
Purpose:
This dataset was designed for Wyoming's Source Water Protection Program as a tool for PWS susceptibility analysis.
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: June 2004
Currentness_Reference: publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111.239918
East_Bounding_Coordinate: -103.805300
North_Bounding_Coordinate: 45.058717
South_Bounding_Coordinate: 40.934277

Keywords:
Theme:
Theme_Keyword_Thesaurus: PSOC
Theme_Keyword: Potential Sources of Contamination
Theme_Keyword: PSOC Lines
Place:
Place_Keyword: Wyoming
Access_Constraints: None.
Use_Constraints: Approval by WDEQ is required before use of this dataset.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Kim Parker
Contact_Organization: Wyoming Dept. of Environmental Quality
Contact_Position: Program Specialist
Contact_Address:
Address_Type: mailing and physical address
Address: Herschler Building, 4th West
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: Wyoming
Postal_Code: 82002
Country: USA
Contact_Voice_Telephone: 307-777-7343
Contact_Facsimile_Telephone: 307-777-5973
Contact_Electronic_Mail_Address: kparke@state.wy.us
Hours_of_Service: 8-5 MST
Data_Set_Credit: Trihydro Corporation and WDEQ
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment:
Microsoft Windows 2000 Version 5.1 (Build 2600) Service Pack 1; ESRI ArcCatalog 8.3.0.800

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Attributes are assumed to be as accurate as the source information provided by US Dept of Transportation and the US Bureau of the Census.
Logical_Consistency_Report:
The accuracy of this dataset varies according to the source information.
Completeness_Report: Complete.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

Horizontal accuracy varies according to the scale of the source data. Roads and Railroads are accurate to approximately a 1:100,000-scale level. Pipelines are accurate to a within 500 feet of their actual location.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: None.
Lineage:
Source_Information:
Source_Scale_Denominator: 100000
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: TIGER Files
Source_Contribution:
US Bureau of the Census TIGER-Line files were used for Roads and Railroads. This data is accurate to a 1:100,000-scale resolution.
Source_Information:
Source_Scale_Denominator: Unknown
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: USDOT Pipelines
Source_Contribution:
Pipelines provided by the US Dept. of Transportation were used directly. Please refer to that layer's metadata for more information.
Process_Step:
Process_Description: Please refer to Project final report.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 9576

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Lambert Conformal Conic
Lambert_Conformal_Conic:
Standard_Parallel: 35.000000
Standard_Parallel: 45.000000
Longitude_of_Central_Meridian: -108.000000
Latitude_of_Projection_Origin: 40.000000
False_Easting: 0.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 0.001024

Ordinate_Resolution: 0.001024
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222

Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: psocs_line
Attribute:
Attribute_Label: FID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.
Attribute:
Attribute_Label: PSOC_NAME
Attribute_Definition: Name of Feature
Attribute:
Attribute_Label: PSOC_TYPE
Attribute_Definition: Type of Potential Contaminant Source
Attribute:
Attribute_Label: PSOC_COMM
Attribute_Definition: Relevant Comments
Attribute:
Attribute_Label: SOURCE
Attribute_Definition: Source of original data
Overview_Description:
Entity_and_Attribute_Overview:
Descriptive information for each PSOC as well as an Internal ID that allows a user to reference back to WDEQ or EPA's original source data if a question arises.

Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:

Trihydro and WDEQ make no claims as to the accuracy of this information. We have made every effort to remove errors in the dataset but many still remain. Most are due to errors in the source information but some minor errors in spatial location may have been created in the conversion to GIS.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 4.524

Metadata_Reference_Information:
Metadata_Date: 20040630
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Chris Arneson
Contact_Organization: Trihydro Corporation
Contact_Position: GIS Hydrologist/EMIS Manager
Contact_Address:
Address_Type:
REQUIRED: The mailing and/or physical address for the organization or individual.
City: REQUIRED: The city of the address.
State_or_Province: REQUIRED: The state or province of the address.
Postal_Code: REQUIRED: The ZIP or other postal code of the address.
Contact_Voice_Telephone: 307-745-7474
Contact_Facsimile_Telephone: 307-745-7729
Contact_Electronic_Mail_Address: carneson@trihydro.com
Hours_of_Service: 8-5 MST
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None.
Metadata_Use_Constraints: None.
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

Generated by mp version 2.8.6 on Thu Oct 04 12:29:29 2007

APPENDIX B-13

METADATA - PSOCs - POINTS

PSOCs - Points

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Chris Arneson, Trihydro Corporation
Originator: Kim Parker, WDEQ
Publication_Date: June 2004
Title: psocs_point
Edition: 1.0
Geospatial_Data_Presentation_Form: vector digital data
Description:
Abstract:
Potential Sources of Contamination for Wyoming. This point layer includes available locations for permitted facilities that may present a potential hazard to public water supplies in Wyoming.
Purpose:
This dataset was designed for Wyoming's Source Water Protection Program as a tool for PWS susceptibility analysis.
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: June 2004
Currentness_Reference: publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111.232691
East_Bounding_Coordinate: -103.825350
North_Bounding_Coordinate: 45.020791
South_Bounding_Coordinate: 40.936282
Keywords:

Theme:
Theme_Keyword_Thesaurus:
REQUIRED: Reference to a formally registered thesaurus or a similar authoritative source of theme keywords.
Theme_Keyword: Permitted Facilities
Theme_Keyword: Potential Sources of Contamination
Theme_Keyword: Contamination Sources
Place:
Place_Keyword: Wyoming
Access_Constraints: None.
Use_Constraints: Approval by WDEQ is required before use of this dataset.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Kim Parker
Contact_Organization: Wyoming Dept. of Environmental Quality
Contact_Position: Program Specialist
Contact_Address:
Address_Type: mailing and physical address
Address: Herschler Building, 4th West
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: Wyoming
Postal_Code: 82002
Country: USA
Contact_Voice_Telephone: 307-777-7343
Contact_Facsimile_Telephone: 307-777-5973
Contact_Electronic_Mail_Address: kparke@state.wy.us
Hours_of_Service: 8-5 MST
Data_Set_Credit: Trihydro Corporation and WDEQ
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment:
Microsoft Windows 2000 Version 5.1 (Build 2600) Service Pack 1; ESRI ArcCatalog 8.3.0.800

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Attributes are assumed to be as accurate as the source information provided by WDEQ, SEO, and EPA.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
Horizontal accuracy varies dramatically depending on what method was used to convert the points to GIS format. When Lat/Long coordinates were used, the

points can be assumed to be of GPS-level accuracy. When PLSS information was used, the point was located to the center of the described QQ section or full section. When Street addresses were used locations can be very accurate (Urban addresses) or miles away from their actual location (Rural Highway addresses).
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: None.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Title: USEPA CERCLA Superfund GIS Points
Source_Scale_Denominator: None
Type_of_Source_Media: online
Source_Citation_Abbreviation: Superfund
Source_Contribution:
USEPA's website provided GIS layers for Superfund sites in Region VIII. See layer metadata for details.
Source_Information:
Source_Scale_Denominator: None
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: Confined Feeding
Source_Contribution:
WDEQ Confined Feeding Excel Table detailing location by Township, Range, and Section.
Source_Information:
Source_Scale_Denominator: None
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: GPC
Source_Contribution:
WDEQ Groundwater Program GPC database contained locations in Lat/Long, PLSS, and Street Addresses.
Source_Information:
Source_Scale_Denominator: None
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: STP
Source_Contribution:
WDEQ Storage Tank Program (STP) contained information by PLSS or Street Address.
Source_Information:
Source_Scale_Denominator: Unknown
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: NPDES
Source_Contribution:
The WDEQ-NPDES program supplied a snapshot of their database depicting locations by PLSS, Lat/Long, and Street Address. Relevant sites were included in the susceptibility analysis.

Source_Information:
Source_Scale_Denominator: Unknown
Type_of_Source_Media: online
Source_Citation_Abbreviation: WOGCC Wells
Source_Contribution:
This Oil & Gas well GIS layer was used directly. Wells that were never drilled were excluded from the dataset.
Source_Information:
Source_Scale_Denominator: None
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: SHWD
Source_Contribution:
Information from WDEQ/SHWD was delivered in a MS-Access database. Information was converted to GIS based on Lat/Long, PLSS, and Address information.
Source_Information:
Source_Scale_Denominator: None
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: UIC Database
Source_Contribution:
The UIC Database was converted to GIS based on Lat/Long, PLSS, and Street Address information.
Source_Information:
Source_Scale_Denominator: 100000
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: UIC GIS
Source_Contribution:
The older UIC GIS information was used to supplement newer database information.
Source_Information:
Source_Scale_Denominator: None
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: VRP
Source_Contribution:
The VRP Database was converted to GIS using PLSS or Street Addresses.
Process_Step:
Process_Description: Please refer to Project final report.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Entity point
Point_and_Vector_Object_Count: 64105

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Lambert Conformal Conic
Lambert_Conformal_Conic:
Standard_Parallel: 35.000000
Standard_Parallel: 45.000000
Longitude_of_Central_Meridian: -108.000000
Latitude_of_Projection_Origin: 40.000000
False_Easting: 0.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 0.001024
Ordinate_Resolution: 0.001024
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222

Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: psocs_point
Attribute:
Attribute_Label: FID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.
Attribute:
Attribute_Label: ID
Attribute_Definition: Unique ID for Labeling
Attribute:
Attribute_Label: PSOC_NAME
Attribute_Definition: Name of Site

Attribute:
Attribute_Label: PSOC_TYPE
Attribute_Definition: Type of Facility
Attribute:
Attribute_Label: PSOC_COMM
Attribute_Definition: Relevant Comments
Attribute:
Attribute_Label: PSOC_INT_I
Attribute_Definition: Internal ID - Can be used to refer to original data source
Attribute:
Attribute_Label: SOURCE
Attribute_Definition: Provider of original data
Attribute:
Attribute_Label: CONTAMINAN
Attribute_Definition:
Potential Contaminant - Description of what contaminant is stored/processed at the facility when available
Attribute_Definition_Source: WDEQ
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Serious
Enumerated_Domain_Value_Definition:
Containing Contaminants listed in EPA Drinking Water Standards as "Serious". These are often carcinogens or bacteriologica threats.
Attribute:
Attribute_Label: JOINID
Attribute:
Attribute_Label: RELEASE
Attribute_Definition: Whether the Site has Released a contaminant to the subsurface
Attribute:
Attribute_Label: CONTRISK
Attribute_Definition: Risk Level of Contamination - Serious or Other
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: Serious
Enumerated_Domain_Value_Definition:
Containing Contaminants listed in EPA Drinking Water Standards as "Serious". These are often carcinogens or bacteriologica threats.
Enumerated_Domain:
Enumerated_Domain_Value: Other
Enumerated_Domain_Value_Definition: Non-Serious Contamination Threat.
Overview_Description:
Entity_and_Attribute_Overview:
Descriptive information for each PSOC as well as an Internal ID that allows a user to reference back to WDEQ or EPA's original source data if a question arises.

Distribution_Information:

Resource_Description: Downloadable Data
Distribution_Liability:
Trihydro and WDEQ make no claims as to the accuracy of this information. We have made every effort to remove errors in the dataset but many still remain. Most are due to errors in the source information but some minor errors in spatial location may have been created in the conversion to GIS.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 19.697

Metadata_Reference_Information:

Metadata_Date: 20040630
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Chris Arneson
Contact_Organization: Trihydro Corporation
Contact_Position: GIS Hydrologist/EMIS Manager
Contact_Address:
Address_Type:
REQUIRED: The mailing and/or physical address for the organization or individual.
City: REQUIRED: The city of the address.
State_or_Province: REQUIRED: The state or province of the address.
Postal_Code: REQUIRED: The ZIP or other postal code of the address.
Contact_Voice_Telephone: 307-745-7474
Contact_Facsimile_Telephone: 307-745-7729
Contact_Electronic_Mail_Address: carneson@trihydro.com
Hours_of_Service: 8-5 MST
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None.
Metadata_Use_Constraints: None.
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

Generated by mp version 2.8.6 on Thu Oct 04 12:31:11 2007

APPENDIX B-14

METADATA - PSOCs - POLYGONS

PSOCs - Polys

Metadata:

Identification_Information:

Citation:
Citation_Information:
Originator: Chris Arneson, Trihydro Corporation
Originator: Kim Parker, WDEQ
Publication_Date: June 2004
Title: psocs_poly
Edition: 1.0
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: \\dc1\swap\GIS\GIS2\PSOCs\psocs_poly.shp
Description:
Abstract:
Potential Sources of Contamination for Wyoming. This polygon layer includes available locations for permitted mines and underground injection permits that may present a potential hazard to public water supplies in Wyoming.
Purpose:
This dataset was designed for Wyoming's Source Water Protection Program as a tool for PWS susceptibility analysis.
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: June 2004
Currentness_Reference: publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111.040494
East_Bounding_Coordinate: -104.055458
North_Bounding_Coordinate: 45.000258
South_Bounding_Coordinate: 41.001953

Keywords:
Theme:
Theme_Keyword_Thesaurus:
REQUIRED: Reference to a formally registered thesaurus or a similar authoritative source of theme keywords.
Theme_Keyword: Permitted Facilities
Theme_Keyword: Potential Sources of Contamination
Theme_Keyword: Contamination Sources
Place:
Place_Keyword: Wyoming
Access_Constraints: None.
Use_Constraints: Approval by WDEQ is required before use of this dataset.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Kim Parker
Contact_Organization: Wyoming Dept. of Environmental Quality
Contact_Position: Program Specialist
Contact_Address:
Address_Type: mailing and physical address
Address: Herschler Building, 4th West
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: Wyoming
Postal_Code: 82002
Country: USA
Contact_Voice_Telephone: 307-777-7343
Contact_Facsimile_Telephone: 307-777-5973
Contact_Electronic_Mail_Address: kparke@state.wy.us
Hours_of_Service: 8-5 MST
Data_Set_Credit: Trihydro Corporation and WDEQ
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment:
Microsoft Windows 2000 Version 5.1 (Build 2600) Service Pack 1; ESRI ArcCatalog 8.3.0.800

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Attributes are assumed to be as accurate as the source information provided by WDEQ and the PWS Operators.
Completeness_Report: Complete
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

Horizontal accuracy varies dramatically depending upon the source information.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: None.
Lineage:
Source_Information:
Source_Scale_Denominator: 100000
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: UIC GIS
Source_Contribution:
UIC Polygons developed by the Wyoming Water Resources Center were used directly.
Source_Information:
Source_Scale_Denominator: 100000
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: WDEQ/LQD Mine Permit Boundaries
Source_Contribution: WDEQ/LQD Active Mine Permit Boundaries were used directly.
Source_Information:
Source_Scale_Denominator: Various
Type_of_Source_Media: paper
Process_Step:
Process_Description: Please refer to Project final report.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: G-polygon
Point_and_Vector_Object_Count: 2006

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.000000
Longitude_Resolution: 0.000000
Geographic_Coordinate_Units: Decimal degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222

Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: psocs_poly

Attribute:
Attribute_Label: FID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.
Attribute:
Attribute_Label: PSOC_NAME
Attribute_Definition: Name of Feature
Attribute:
Attribute_Label: PSOC_TYPE
Attribute_Definition: Type of feature
Attribute:
Attribute_Label: PSOC_COMM
Attribute_Definition: Relevant Comments
Attribute:
Attribute_Label: PSOC_INT_I
Attribute_Definition:
PSOC Internal ID allowing user to refer back to original data if questions arise
Overview_Description:
Entity_and_Attribute_Overview:
Descriptive information for each PSOC as well as an Internal ID that allows a user to reference back to WDEQ or EPA's original source data if a question arises.

Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Trihydro and WDEQ make no claims as to the accuracy of this information. We have made every effort to remove errors in the dataset but many still remain. Most are due to errors in the source information but some minor errors in spatial location may have been created in the conversion to GIS.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.849

Metadata_Reference_Information:
Metadata_Date: 20040630
Metadata_Contact:

Contact_Information:
Contact_Person_Primary:
Contact_Person: Chris Arneson
Contact_Organization: Trihydro Corporation
Contact_Position: GIS Hydrologist/EMIS Manager
Contact_Address:
Address_Type:
REQUIRED: The mailing and/or physical address for the organization or individual.
City: REQUIRED: The city of the address.
State_or_Province: REQUIRED: The state or province of the address.
Postal_Code: REQUIRED: The ZIP or other postal code of the address.
Contact_Voice_Telephone: 307-745-7474
Contact_Facsimile_Telephone: 307-745-7729
Contact_Electronic_Mail_Address: carneson@trihydro.com
Hours_of_Service: 8-5 MST
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None.
Metadata_Use_Constraints: None.
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

APPENDIX B-15

METADATA - RAILROADS

Railroads

```
Identification_Information:
  Citation:
    Citation_Information:
      Originator: University of Wyoming Dept. of Geography
      Publication_Date: 2002
      Title: Digital Wyoming Atlas
      Geospatial_Data_Presentation_Form: map
      Publication_Information:
        Publication_Place: Laramie, Wyoming
        Publisher: University of Wyoming Dept. of Geography
      Online_Linkage: <URL:http://www.wygisc.uwyo.edu/atlas.html>

  Description:
    Abstract:

      The Digital Wyoming Atlas currently contains over 250 maps of Wyoming in
many different
      categories. The maps are organized into several categories:
Population/Society, Economy,
      History/Culture, Recreation/Tourism, and Transportation/Communication.
      A unique aspect of this Atlas is that most of the data comprising these
maps is
      digital geospatial data and is available for download. Digital geospatial
data contains not
      only database information, but spatial information as well. Because of the
spatial
      component, any of the data comprising these maps can be "overlayed" and
analyzed for
      relationships, using Geographic Information Systems (GIS) software.

    Purpose:
      The datasets described by this document were developed for a state atlas.
As such,
      they are not intended to be precise or accurate beyond a statewide level.
Most of the data
      was collected at a statewide level, compiled by county or by city/town.
This data should
      not be used for analysis at any scale larger than the state of Wyoming.

  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: various dates
    Currentness_Reference: Please see individual datasets for more specific
source dates.
  Status:
    Progress: in progress
    Maintenance_and_Update_Frequency: unknown

  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -111.36554566
      East_Bounding_Coordinate: -103.78380412
```

```
      North_Bounding_Coordinate: 44.99390988
      South_Bounding_Coordinate: 40.94479444
  Keywords:
    Theme:
      Theme_Keyword_Thesaurus: none
      Theme_Keyword: Population
      Theme_Keyword: Society
      Theme_Keyword: Economy
      Theme_Keyword: Environment
      Theme_Keyword: Transporation
      Theme_Keyword: Communication
      Theme_Keyword: History
      Theme_Keyword: Culture
      Theme_Keyword: Recreation
      Theme_Keyword: Tourism

    Place:
      Place_Keyword_Thesaurus: none
      Place_Keyword: Wyoming

  Access_Constraints: none
  Use_Constraints:
    The data should not be used at scales larger than the state of Wyoming
    (e.g. county, regional, small area)

  Point_of_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Data Manager
        Contact_Organization: Wyoming Geographic Information Science Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 4008 University Station
        City: Laramie
        State_or_Province: Wyoming
        Postal_Code: 82071
        Country: USA
      Contact_Voice_Telephone: 307-766-2751
      Contact_Electronic_Mail_Address: n/a
      Hours_of_Service:
        8:00 - 5:00 MST


  Data_Set_Credit:
    William Gribb, Dept of Geography, University of Wyoming. Many students
    participated in the development of this atlas.

  Native_Data_Set_Environment:
    ArcView 3.x


Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report: Not available.
    Quantitative_Attribute_Accuracy_Assessment:
      Attribute_Accuracy_Value: unknown
      Attribute_Accuracy_Explanation: none
```

Logical_Consistency_Report: not available
Completeness_Report: not available

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
The majority of the data used for the Digital Wyoming Atlas was compiled either by city or by county. Attribute data was joined to Wyoming counties (polygon, 1:100,000 scale) or to Wyoming cities/towns (estimated coordinate locations). For more information on these two datasets, please see their metadata documents:

Wyoming counties:
http://www.wygisc.uwyo.edu/clearinghouse/metadata/county.html

Wyoming cities/towns:
http://www.wygisc.uwyo.edu/clearinghouse/metadata/city.html

Some data was compiled by other geographic features, for instance:

Timber production, compiled by national forest boundary:
http://www.wygisc.uwyo.edu/clearinghouse/metadata/managed.html

Air quality: lat/long coordinates compiled by U.S. EPA

Cemetaries: lat/long coorindates from USGS Geographic Name Inforamtion System

Continental Divide: digitized from 1:100,000 USGS Digital Raster Graphics (topographic maps)

Drought: climatic regions digitized from 1:250,000-scale map from the National Climatic Data Center

Earthquakes: lat/long coordinates provided by the National Earthquake Information Center

Unique natural areas, fishing areas, hiking trails, scenic drives, campgrounds: digitized from
1:100,000 USGS Digital Raster Graphics (topographic maps) corresponding to the Delorme Atlas of Wyoming

Historical trails: digitized from a 1:500,000-scale map produced by the Bureau of Land Management

Popluation by census tracts and census blocks: tract and block boundaries obtained from the U.S. Census (1:100,000-scale)

Tornados: lat/long coordinates from the NOAA storm prediction center

Lineage:
Process_Step:
Process_Description:
Most of the data was compiled in a spreadsheet, by geographic unit (usually county or town

names). The spreadsheet was then converted to Dbase and joined to the geographic units
in ArcView.

Each dataset has its own source and method description, providing specific details.
Source_Used_Citation_Abbreviation: various
Process_Date: 1999-2002

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: .001
Longitude_Resolution: .001
Geographic_Coordinate_Units: Decimal Degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: GRS1980
Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio: 298.2572221

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Data Manager
Contact_Organization: Wyoming Geographic Information Science Center
Contact_Address:
Address_Type: mailing address
Address: Box 4008 University Station
City: Laramie
State_or_Province: Wyoming
Country: USA
Postal_Code: 82071
Contact_Voice_Telephone: 307-766-2735
Contact_Electronic_Mail_Address: n/a
Distribution_Liability:
The distributor shall not be held liable for improper or
incorrect use of this data, based on the description of
appropriate/inappropriate used described in this metadata
document.
The distributor makes no claims for the data's suitability for other purposes.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: Shapefile
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: ftp.sdvc.uwyo.edu or http://www.sdvc.uwyo.edu/clearinghouse
Access_Instructions: http://www.sdvc.uwyo.edu/clearinghouse/howto.html
Online_Computer_and_Operating_System:
Both the ftp and WWW server which this data is available
from is a Silicon Graphics Challenge server, running

the IRIX 6.2 UNIX operating system.
Fees: No fees are required for downloading the data that is on-line. Some
Fees: may be required to cover costs of tapes if data is required on tape media.

Metadata_Reference_Information:
  Metadata_Date: 200203
  Metadata_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: Margo Berendsen
      Contact_Address:
        Address_Type: mailing address
        Address: Box 4008 University Station
        City: Laramie
        State_or_Province: Wyoming
        Postal_Code: 82071
        Country: USA
      Contact_Voice_Telephone: 307-766-2751
      Contact_Electronic_Mail_Address: meh@uwyo.edu
  Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998

APPENDIX B-16

METADATA - ROADS

Roads

```
Entry_ID: (required)
Entry_Title: Wyoming Roads - TIGER
Group: Data_Set_Citation
  Originator(s): US Census TIGER files
  Title: Wyoming Roads - TIGER
  Publication: TIGER/Line Census Files
  Publication_Date: 199711
  Publication_Place: Laramie, WY
  Publisher: Spatial Data and Visualization Center
  Edition: 1995
  URL: <URL:http://www.sdvc.uwyo.edu/clearinghouse/road/quad.html>
End_Group
Keyword: Road
Keyword: TIGER
Keyword: Transportation
Group: Temporal_Coverage
  Start_date: 19950830
  Stop_date: 19950830
End_Group
Data_Set_Progress: Complete
Group: Spatial_Coverage
  Southernmost_Latitude: 41
  Northernmost_Latitude: 45
  Westernmost_Longitude: -111
  Easternmost_Longitude: -104
End_Group
Location: Wyoming
Location: Albany county
Location: Big Horn county
Location: Laramie county
Location: Johnson county
Location: Natrona county
Location: Uinta county
Location: Sweetwater county
Location: Campbell county
Location: Teton county
Location: Crook county
Location: Weston county
Location: Albany county
Location: Converse county
Location: Park county
Location: Hot Springs county
Location: Carbon county
Location: Sublette county
Location: Niobrara county
Location: Lincoln county
Location: Fremont county
Location: Sheridan county
Location: Platte county
Location: Washakie county
Group: Data_Resolution
  Latitude_Resolution: 0.01
  Longitude_Resolution: 0.01
```

End_Group
  Access_Constraints: None.
  Use_Constraints: Should not be used at scales greater than 1:100,000.
Originating_Center: (required)
Group: Data_Center
  Data_Center_Name: Spatial Data and Visualization Center
Group: Data_Center_Contact
  Last_name: Manager
  First_name: Data
  Email: n/a
  Phone: 307-766-2751
  Group: Address
    Box 4008 University Station
    Laramie, Wyoming 82071
    USA
  End_Group
End_Group
End_Group
  Storage_Medium: The data was converted from TIGER format to ARC/INFO 7.1, vector line format. The data is available (both statewide and tiles) in ARC/INFO export file format and in ArcView shapefile format for download.
Group: Distribution
  Distribution_Media: online
  Distribution_Format : ARCE (Arc/Info export)
  Fees: No fees are required for downloading the data that is on-line. Some fees may be required to cover costs of tapes if data is required on tape media.
End_Group
Group: Reference
End_Group
Group: Summary
  To provide a base transportation network for GIS display and analysis.

  Transportation for Wyoming, including interstates, state and county highways, neighborhood and connecting roads, jeep trails, and other road and trail types,
  developed by the US Census at 1:100,000-scale. The Wyoming Water Resources Lab has tiled this information together by 1:100,000 quadrangles for Wyoming and created an attribute table which contains a description of the primary road/trail attribute, CFCC.

  A subset of this dataset is also available, including only federal and state highways for simplified display purposes. In order to reduce the size of this subset, the line segments were dissolved to remove unecessary segments.

  The data is available (both statewide and tiles) in ARC/INFO export file format and in ArcView shapefile format.

  To find out more about TIGER/Line files and other Census TIGER data base derived data sets visit http://www.census.gov/geo/www/tiger.
End_Group
Group: DIF_Author
  Last_name: Berendsen
  First_name: Margo
  Email: meh@uwyo.edu
  Phone: 307-766-2751

```
  Group: Address
    Box 4008 University Station
    Laramie, Wyoming 82071
    USA
  End_Group
End_Group
DIF_Revision_Date: 19980312
Science_Review_Date:
```

APPENDIX B-17

METADATA - SCANNED USGS QUADS 24K

Scanned USGS Quads 24K

1:24,000 Wyoming Enhanced Digital Raster Graphics
(DRG-E)
Metadata:
? Identification_Information
? Data_Quality_Information
? Spatial_Data_Organization_Information
? Spatial_Reference_Information
? Entity_and_Attribute_Information
? Distribution_Information
? Metadata_Reference_Information

Identification_Information:
Citation:
Citation_Information:
Originator: Beartooth Mapping Inc.
Publication_Date: 19990301
Title: 1:24,000 DRG-E
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Red Lodge, MT
Publisher: Beartooth Mapping Inc.
Description:
Abstract: The Digital Raster Graphic (DRG) is a raster image of a scanned USGS topographic map including the collar information, georeferenced to the UTM grid. The
DRG-E was processed by removing the map collar information.
Purpose: (USGS Description) A DRG is useful as a source or background layer in a GIS, as a means to perform quality assurance on other digital products, and as a source
for the collection and revision of DLG data. DRG's can also be merged with other digital data, e.g. DEM's or DOQ's, to produce a hybrid digital file. Multiple DRG-E
files may be viewed simultaneously due to the removal of the map collar information.
Supplemental_Information:
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19980201
Currentness_Reference: ground condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: irregular
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -112.000000
East_Bounding_Coordinate: -104.000000
North_Bounding_Coordinate: 45.000000
South_Bounding_Coordinate: 41.000000
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: digital raster graphic

Theme_Keyword: DRG
Theme_Keyword: topographic map
Place:
Place_Keyword_Thesaurus: Department of Commerce, 1977, Countries, Dependencies, Areas of Special Sovereignty, and their Principal Administrative Divisions (Federal Information Processing Standard 10-3): Washington, Department of Commerce, National Institute of Standards and Technology.
Place_Keyword: US
Place_Keyword_Thesaurus: Department of Commerce, 1987, Codes for the Identification of the States, The District of Columbia and the Outlying Areas Of The United States, and Associated Areas (Federal Information Processing Standard 5-2): Washington, Department of Commerce, National Institute of Standards and Technology.
Place_Keyword: ID
Place_Keyword: WY
Place_Keyword: MT
Access_Constraints: None
Use_Constraints: Should not be used at scales greater than 1:24,000. These data were initially developed by the USGS and enhanced by Beartooth Mapping Inc. Please acknowledge Beartooth Mapping Inc. and the USGS in products derived from these data.
Data_Set_Credit: The DRG was initially produced through an Innovative Partnership agreement between The Land Information Technology Company, Ltd., of Aurora, CO and the USGS. Thanks to the Wyoming Office of GIS for the Wyoming dataset.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: The original DRG was an 8-bit color image that employs a color palette to ensure uniform colors throughout a particular DRG series. All DRG's within a series must have the same RGB value.
Logical_Consistency_Report: Not Applicable
Completeness_Report:(USGS description) The DRG is a faithfully reproduced digital image of the original source map. Some differences may be detected between the source graphic used and the DRG due to the RGB values assigned that particular color. The intent is to recreate those colors as near as possible. Data completeness for DRG files reflect content of the source graphic. Features may have been eliminated or generalized on the source graphic due to scale and legibility constraints. For information on collection and inclusion criteria, see U.S. Geological Survey, 1994, Standards for 1:24,000-Scale Digital Line Graphs and Quadrangle Maps: National Mapping Program Technical Instructions and U.S. Geological Survey, 1994, Standards for Digital Line Graphs: National Mapping Program Technical Instructions.
Positional_Accuracy:
Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report: The datum of the published map is retained
to be consistent with other USGS digital data.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: Variable.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: USGS
Publication_Date: Variable
Title: Variable
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Reston, VA
Publisher: USGS
Source_Scale_Denominator: 24000
Type_of_Source_Media: paper
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: Variable
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: map1
Source_Contribution: The source map is scanned to produce the DRG.
Process_Step:
Process_Description:
The production procedures, instrumentation, hardware, and software used in the collection of standard DRG products vary depending on systems used at the contract,
cooperator or USGS production sites. The majority of DRG data sets are acquired through government contract. The process step describes, in general, the process used
in the production of standard DRG data sets.
1) Production of a DRG begins with the scanning of a paper 7.5-minute topographic
map (map1) on a high-resolution scanner. Scanning resolutions range from 500 - 1000
dpi with the output file running between 160-300 mb.
2) Removal of screens (descreening) and color quantization to reduce the number of
colors also takes place during the scanning phase.
3) The raw scan file is then transformed and georeferenced using UTM coordinates of
the sixteen 2.5-minute grid ticks, which are obtained using the in-house produced
program COORDAT and stored in a ground control file. Those sixteen 2.5-minute ticks
are interactively visited and assigned their respective UTM coordinates. USGS program
XSHAPES4 then performs a piecewise linear rubber sheet transformation.
4) An output resolution of 2.4 meters (8.2 feet) is chosen in order to resample the file to
250 dpi.
5) The image file is converted to a TIFF and further reduced by converting the file to a
run length encoding Packbits compression (type 32773).

6) The color palette of the compressed DRG is then standardized by replacing the original RGB values assigned during the scanning process with standard RGB value combinations using the in-house produced TIFFREMAP program.
7) Prior to archiving the DRG undergoes the following quality assurance procedures:
a) The color index values of each DRG are checked to ensure the RGB combinations are consistent with the standardized color palette.
b) All DRG files are inspected to ensure that they are geometrically consistent with
normal map presentation.
c) Selected DRG 's are checked to ensure that data elements in the DRG metadata file
correspond to the map collar information and to the information in the associated image
file.
d) Selected DRG 's are checked for georeferencing accuracy by comparing the book value of latitude and longitude tick marks with corresponding tick intersections in the
DRG image.
e) Transformations are checked on selected DRG's by comparing the positions of well
defined points, such as UTM grid intersections in the graphic product, with the corresponding image points in the DRG.
USGS DRG production specifications are available on request from the National Mapping Division and Mid-Continent Mapping Center by contacting:
Rolla-ESIC
U.S.Geological Survey
1400 Independence Rd., MS231
Rolla, MO 65401-2602
Phone (573)308-3500
Facsimile (573)308-3615
E-mail to mcmcesic@usgs.gov
World Wide Web: http://mcmcweb.er.usgs.gov/drg/
Source_Used_Citation_Abbreviation: map1
Process_Date: 19990201
Process_Step:
Process_Description:
The DRG TIFF imagery was converted to Environmental Systems Research Institute, Inc. (ESRI) GRID format using ARC/INFO for Windows NT. The GRID datasets were then clipped using a 1:250,000-scale quadrangle index ARC/INFO coverage to remove the map collar information. The clipped GRID datasets were then merged and
re-clipped to a UTM (Zone 12 or 13) rectangle defining the maximum quadrangle extent. The final GRID datasets were converted back to TIFF imagery using ARC/INFO.
ARC/INFO is a trademark of ESRI, Inc.
Process_Date: 19990125
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068

Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: Variable
Column_Count: Variable

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 12 (Longitude blocks 108-111) 13 (Longitude blocks 104-107)
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.9996
Longitude_of_Central_Meridian: -111.000(Zone 12), -105.000(Zone 13)
Latitude_of_Projection_Origin: 0.0
False_Easting: 500000
False_Northing: 0.0
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 2.44
Ordinate_Resolution: 2.44
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum 1927
Ellipsoid_Name: Clarke 1866
Semi-major_Axis: 6378206.4
Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
Each raster entity or pixel is an 8-bit index color as in the original DRG.
Entity_and_Attribute_Detail_Citation: Draft Standards for Digital Raster Graphics

Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing address
Address: Box 2075
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Contact_Voice_Telephone: (406) 446-1007

Contact_Voice_Telephone: (406) 446-1012
Distribution_Liability: Although these data have been processed successfully on a
computer system at Beartooth Mapping Inc., no warranty expressed or implied is made
by Beartooth Mapping Inc. regarding the use of the data on any other system, nor does
the act of distribution constitute any such warranty.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: TIFF
Format_Version_Number: None
File_Decompression_Technique: Packbits
Digital_Transfer_Option:
Offline_Option:
Offline_Media: CD-ROM
Recording_Format: ISO 9660; DRG-E image files with corresponding metadata files.
Fees: Contact Beartooth Mapping Inc. for CD-ROM product cost.
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: PO Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com

Metadata_Reference_Information:
Metadata_Date: 19980416
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: PO Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: June 8, 1994

APPENDIX B-18

METADATA - SCANNED USGS QUADS 100K

Scanned USGS Quads 100K

1:100,000 Wyoming Enhanced Digital Raster Graphics
(DRG-E)
Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Beartooth Mapping Inc.
Publication_Date: 19990301
Title: 1:100,000 DRG-E
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Red Lodge, MT
Publisher: Beartooth Mapping Inc.
Description:
Abstract: The Digital Raster Graphic (DRG) is a raster image of a scanned USGS topographic map including the collar information, georeferenced to the UTM grid. The
DRG-E was processed by removing the map collar information.
Purpose: (USGS Description) A DRG is useful as a source or background layer in a GIS, as a means to perform quality assurance on other digital products, and as a source
for the collection and revision of DLG data. DRG's can also be merged with other digital data, e.g. DEM's or DOQ's, to produce a hybrid digital file. Multiple DRG-E
files may be viewed simultaneously due to the removal of the map collar information.
Supplemental_Information:
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19980301
Currentness_Reference: ground condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: irregular
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -112.000000
East_Bounding_Coordinate: -104.000000
North_Bounding_Coordinate: 45.000000
South_Bounding_Coordinate: 41.000000
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: digital raster graphic
Theme_Keyword: DRG
Theme_Keyword: topographic map
Place:
Place_Keyword_Thesaurus: Department of Commerce, 1977, Countries, Dependencies, Areas of Special Sovereignty, and their Principal Administrative Divisions (Federal Information Processing Standard 10-3): Washington, Department of

Commerce, National Institute of Standards and Technology.
Place_Keyword: US
Place_Keyword_Thesaurus: Department of Commerce, 1987, Codes for the Identification of the States, The District of Columbia and the Outlying Areas Of The United States, and Associated Areas (Federal Information Processing Standard 5-2): Washington, Department of Commerce, National Institute of Standards and Technology.
Place_Keyword: ID
Place_Keyword: WY
Place_Keyword: MT
Access_Constraints: None
Use_Constraints: Should not be used at scales greater than 1:100,000. These data were initially developed by the USGS and enhanced by Beartooth Mapping Inc. Please acknowledge Beartooth Mapping Inc. and the USGS in products derived from these data.
Data_Set_Credit: The DRG was initially produced through an Innovative Partnership agreement between The Land Information Technology Company, Ltd., of Aurora, CO and the USGS.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: The original DRG was an 8-bit color image that employs a color palette to ensure uniform colors throughout a particular DRG series. All DRG's within a series must have the same RGB value. The DRG-E (MrSID format) is a 24-bit RGB image.
Logical_Consistency_Report: Not Applicable
Completeness_Report: ***Known errors exist in tile 43110e (Jackson Lake). The original TIFF image contains a systematic offset in the northern half of the quadrangle. This error has not been corrected to-date*** (USGS description) The DRG is a faithfully reproduced digital image of the original source map. Some differences may be detected between the source graphic used and the DRG due to the RGB values assigned that particular color. The intent is to recreate those colors as near as possible.
Data completeness for DRG files reflect content of the source graphic. Features may have been eliminated or generalized on the source graphic due to scale and legibility constraints. For information on collection and inclusion criteria, see U.S. Geological Survey, 1994, Standards for 1:24,000-Scale Digital Line Graphs and Quadrangle Maps: National Mapping Program Technical Instructions and U.S. Geological Survey, 1994, Standards for Digital Line Graphs: National Mapping Program Technical Instructions.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: The datum of the published map is retained

to be consistent with other USGS digital data.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: Variable.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: USGS
Publication_Date: Variable
Title: Variable
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Reston, VA
Publisher: USGS
Source_Scale_Denominator: 100000
Type_of_Source_Media: paper
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: Variable
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: map1
Source_Contribution: The source map is scanned to produce the DRG.
Process_Step:
Process_Description:
The production procedures, instrumentation, hardware, and software used in the collection of standard DRG products vary depending on systems used at the contract,
cooperator or USGS production sites. The majority of DRG data sets are acquired through government contract. The process step describes, in general, the process used
in the production of standard DRG data sets.
1) Production of a DRG begins with the scanning of a paper 7.5-minute topographic
map (map1) on a high-resolution scanner. Scanning resolutions range from 500 - 1000
dpi with the output file running between 160-300 mb.
2) Removal of screens (descreening) and color quantization to reduce the number of
colors also takes place during the scanning phase.
3) The raw scan file is then transformed and georeferenced using UTM coordinates of
the sixteen 2.5-minute grid ticks, which are obtained using the in-house produced
program COORDAT and stored in a ground control file. Those sixteen 2.5-minute ticks
are interactively visited and assigned their respective UTM coordinates. USGS program
XSHAPES4 then performs a piecewise linear rubber sheet transformation.
4) An output resolution of 2.4 meters (8.2 feet) is chosen in order to resample the file to
250 dpi.
5) The image file is converted to a TIFF and further reduced by converting the file to a
run length encoding Packbits compression (type 32773).
6) The color palette of the compressed DRG is then standardized by replacing the original RGB values assigned during the scanning process with standard RGB value

combinations using the in-house produced TIFFREMAP program.
7) Prior to archiving the DRG undergoes the following quality assurance procedures:
a) The color index values of each DRG are checked to ensure the RGB combinations are consistent with the standardized color palette.
b) All DRG files are inspected to ensure that they are geometrically consistent with
normal map presentation.
c) Selected DRG 's are checked to ensure that data elements in the DRG metadata file
correspond to the map collar information and to the information in the associated image
file.
d) Selected DRG 's are checked for georeferencing accuracy by comparing the book value of latitude and longitude tick marks with corresponding tick intersections in the
DRG image.
e) Transformations are checked on selected DRG's by comparing the positions of well
defined points, such as UTM grid intersections in the graphic product, with the corresponding image points in the DRG.
USGS DRG production specifications are available on request from the National Mapping Division and Mid-Continent Mapping Center by contacting:
Rolla-ESIC
U.S.Geological Survey
1400 Independence Rd., MS231
Rolla, MO 65401-2602
Phone (573)308-3500
Facsimile (573)308-3615
E-mail to mcmcesic@usgs.gov
World Wide Web: http://mcmcweb.er.usgs.gov/drg/
Source_Used_Citation_Abbreviation: map1
Process_Date: 19990125
Process_Step:
Process_Description:
The DRG TIFF imagery was converted to Environmental Systems Research Institute, Inc. (ESRI) GRID format using ARC/INFO for Windows NT. The GRID datasets were then clipped using a 1:250,000-scale quadrangle index ARC/INFO coverage to remove the map collar information. The clipped GRID datasets were then merged and
re-clipped to a UTM (Zone 12 or 13) rectangle defining the maximum quadrangle extent. The final GRID datasets were converted back to TIFF imagery using ARC/INFO.
ARC/INFO is a trademark of ESRI, Inc.
Process_Date: 19990125
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007

Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: Variable
Column_Count: Variable

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 12 (Longitude blocks 108/110) 13 (Longitude blocks 104/106)
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.9996
Longitude_of_Central_Meridian: -111.000(Zone 12), -105.000(Zone 13)
Latitude_of_Projection_Origin: 0.0
False_Easting: 500000
False_Northing: 0.0
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 25.40000078
Ordinate_Resolution: 25.40000078
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum 1927
Ellipsoid_Name: Clarke 1866
Semi-major_Axis: 6378206.4
Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
Each raster entity or pixel is an 8-bit index color as in the original DRG.
Entity_and_Attribute_Detail_Citation: Draft Standards for Digital Raster
Graphics

Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing address
Address: Box 2075
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Contact_Voice_Telephone: (406) 446-1007
Contact_Voice_Telephone: (406) 446-1012
Distribution_Liability: Although these data have been processed successfully on
a

computer system at Beartooth Mapping Inc., no warranty expressed or implied is made
by Beartooth Mapping Inc. regarding the use of the data on any other system, nor does
the act of distribution constitute any such warranty.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: Tiff
Format_Version_Number: None
File_Decompression_Technique: Packbits
Digital_Transfer_Option:
Offline_Option:
Offline_Media: CD-ROM
Recording_Format: ISO 9660; DRG-E image files with corresponding metadata files.
Fees: Contact Beartooth Mapping Inc. for CD-ROM product cost.
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: PO Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com

Metadata_Reference_Information:
Metadata_Date: 19980416
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: PO Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: June 8, 1994

APPENDIX B-19

METADATA - SCANNED USGS QUADS 250K

Scanned USGS Quads 250K

1:250,000 Wyoming Enhanced Digital Raster Graphics (DRG-E)
Metadata:
* Identification_Information
* Data_Quality_Information
* Spatial_Data_Organization_Information
* Spatial_Reference_Information
* Entity_and_Attribute_Information
* Distribution_Information
* Metadata_Reference_Information

Identification_Information:
Citation:
Citation_Information:
Originator: Beartooth Mapping Inc.
Publication_Date: 19990301
Title: 1:250,000 DRG-E
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Red Lodge, MT
Publisher: Beartooth Mapping Inc.
Description:
Abstract: The Digital Raster Graphic (DRG) is a raster image of a scanned USGS topographic map including the collar information, georeferenced to the UTM grid. The DRG-E was processed by removing the map collar information.
Purpose: (USGS Description) A DRG is useful as a source or background layer in a GIS, as a means to perform quality assurance on other digital products, and as a source for the collection and revision of DLG data. DRG's can also be merged with other digital data, e.g. DEM's or DOQ's, to produce a hybrid digital file. Multiple DRG-E files may be viewed simultaneously due to the removal of the map collar information.
Supplemental_Information:
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19980301
Currentness_Reference: ground condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: irregular
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -112.000000
East_Bounding_Coordinate: -104.000000
North_Bounding_Coordinate: 45.000000
South_Bounding_Coordinate: 41.000000
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: digital raster graphic
Theme_Keyword: DRG
Theme_Keyword: topographic map
Place:

Place_Keyword_Thesaurus: Department of Commerce, 1977, Countries, Dependencies, Areas of Special Sovereignty, and their Principal Administrative Divisions (Federal Information Processing Standard 10-3): Washington, Department of Commerce, National Institute of Standards and Technology.
Place_Keyword: US
Place_Keyword_Thesaurus: Department of Commerce, 1987, Codes for the Identification of the States, The District of Columbia and the Outlying Areas Of The United States, and Associated Areas (Federal Information Processing Standard 5-2): Washington, Department of Commerce, National Institute of Standards and Technology.
Place_Keyword: ID
Place_Keyword: WY
Place_Keyword: MT
Access_Constraints: None
Use_Constraints: Should not be used at scales greater than 1:250,000. These data were initially developed by the USGS and enhanced by Beartooth Mapping Inc. Please acknowledge Beartooth Mapping Inc. and the USGS in products derived from these data.
Data_Set_Credit: The DRG was initially produced through an Innovative Partnership agreement between The Land Information Technology Company, Ltd., of Aurora, CO and the USGS.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: The original DRG was an 8-bit color image that employs a color palette to ensure uniform colors throughout a particular DRG series. All DRG's within a series must have the same RGB value. The DRG-E (MrSID format) is a 24-bit RGB image.
Logical_Consistency_Report: Not Applicable
Completeness_Report: (USGS description) The DRG is a faithfully reproduced digital image of the original source map. Some differences may be detected between the source graphic used and the DRG due to the RGB values assigned that particular color. The intent is to recreate those colors as near as possible. Data completeness for DRG files reflect content of the source graphic. Features may have been eliminated or generalized on the source graphic due to scale and legibility constraints. For information on collection and inclusion criteria, see U.S. Geological Survey, 1994, Standards for 1:24,000-Scale Digital Line Graphs and Quadrangle Maps: National Mapping Program Technical Instructions and U.S. Geological Survey, 1994, Standards for Digital Line Graphs: National Mapping Program Technical Instructions.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: The datum of the published map is retained to be consistent with other USGS digital data.
Vertical_Positional_Accuracy:
Vertical_Positional_Accuracy_Report: Variable.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: USGS
Publication_Date: Variable
Title: Variable
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Reston, VA
Publisher: USGS

Source_Scale_Denominator: 250000
Type_of_Source_Media: paper
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: Variable
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: map1
Source_Contribution: The source map is scanned to produce the DRG.
Process_Step:
Process_Description:
The production procedures, instrumentation, hardware, and software used in the collection of standard DRG products vary depending on systems used at the contract, cooperator or USGS production sites. The majority of DRG data sets are acquired through government contract. The process step describes, in general, the process used in the production of standard DRG data sets.
1) Production of a DRG begins with the scanning of a paper 7.5-minute topographic map (map1) on a high-resolution scanner. Scanning resolutions range from 500 - 1000 dpi with the output file running between 160-300 mb.
2) Removal of screens (descreening) and color quantization to reduce the number of colors also takes place during the scanning phase.
3) The raw scan file is then transformed and georeferenced using UTM coordinates of the sixteen 2.5-minute grid ticks, which are obtained using the in-house produced program COORDAT and stored in a ground control file. Those sixteen 2.5-minute ticks are interactively visited and assigned their respective UTM coordinates. USGS program XSHAPES4 then performs a piecewise linear rubber sheet transformation.
4) An output resolution of 2.4 meters (8.2 feet) is chosen in order to resample the file to 250 dpi.
5) The image file is converted to a TIFF and further reduced by converting the file to a run length encoding Packbits compression (type 32773).
6) The color palette of the compressed DRG is then standardized by replacing the original RGB values assigned during the scanning process with standard RGB value combinations using the in-house produced TIFFREMAP program.
7) Prior to archiving the DRG undergoes the following quality assurance procedures:
a) The color index values of each DRG are checked to ensure the RGB combinations are consistent with the standardized color palette.
b) All DRG files are inspected to ensure that they are geometrically consistent with normal map presentation.
c) Selected DRG 's are checked to ensure that data elements in the DRG metadata file correspond to the map collar information and to the information in the associated image file.
d) Selected DRG 's are checked for georeferencing accuracy by comparing the book value of latitude and longitude tick marks with corresponding tick intersections in the DRG image.
e) Transformations are checked on selected DRG's by comparing the positions of well defined points, such as UTM grid intersections in the graphic product, with the corresponding image points in the DRG.
USGS DRG production specifications are available on request from the National Mapping Division and Mid-Continent Mapping Center by contacting:
Rolla-ESIC
U.S.Geological Survey
1400 Independence Rd., MS231
Rolla, MO 65401-2602
Phone (573)308-3500
Facsimile (573)308-3615

E-mail to mcmcesic@usgs.gov
World Wide Web: http://mcmcweb.er.usgs.gov/drg/
Source_Used_Citation_Abbreviation: map1
Process_Date: 19990125
Process_Step:
Process_Description:
The DRG TIFF imagery was converted to Environmental Systems Research Institute, Inc. (ESRI) GRID format using ARC/INFO for Windows NT. The GRID datasets were then clipped using a 1:250,000-scale quadrangle index ARC/INFO coverage to remove the map collar information. The clipped GRID datasets were then merged and re-clipped to a UTM (Zone 12 or 13) rectangle defining the maximum quadrangle extent. The final GRID datasets were converted back to TIFF imagery using ARC/INFO.
ARC/INFO is a trademark of ESRI, Inc.
Process_Date: 19990125
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: Variable
Column_Count: Variable

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 12 (Longitude blocks 108/110) 13 (Longitude blocks 104/106)
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.9996
Longitude_of_Central_Meridian: -111.000(Zone 12), -105.000(Zone 13)
Latitude_of_Projection_Origin: 0.0
False_Easting: 500000
False_Northing: 0.0
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 25.40000078
Ordinate_Resolution: 25.40000078
Planar_Distance_Units: meters
Geodetic_Model:

Horizontal_Datum_Name: North American Datum 1927
Ellipsoid_Name: Clarke 1866
Semi-major_Axis: 6378206.4
Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
Each raster entity or pixel is an 8-bit index color as with the original DRG.
Entity_and_Attribute_Detail_Citation: Draft Standards for Digital Raster Graphics

Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing address
Address: Box 2075
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Contact_Voice_Telephone: (406) 446-1007
Contact_Voice_Telephone: (406) 446-1012
Distribution_Liability: Although these data have been processed successfully on a computer system at Beartooth Mapping Inc., no warranty expressed or implied is made by Beartooth Mapping Inc. regarding the use of the data on any other system, nor does the act of distribution constitute any such warranty.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: Tiff
Format_Version_Number: None
File_Decompression_Technique: Packbits
Digital_Transfer_Option:
Offline_Option:
Offline_Media: CD-ROM
Recording_Format: ISO 9660; DRG-E image files with corresponding metadata files.
Fees: Contact Beartooth Mapping Inc. for CD-ROM product cost.
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: PO Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com

Metadata_Reference_Information:
Metadata_Date: 19980416

Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Beartooth Mapping Inc.
Contact_Address:
Address_Type: mailing and physical address
Address: PO Box 2075, 114 S. Hauser, Suite E
City: Red Lodge
State_or_Province: Montana
Postal_Code: 59068
Country: USA
Contact_Voice_Telephone: (406) 446-1007
Contact_Facsimile_Telephone: (406) 446-1012
Contact_Electronic_Mail_Address: toohill@BeartoothMaps.com
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: June 8, 1994

APPENDIX B-20

METADATA - TOXIC RELEASE INVENTORY POINTS

U.S. EPA Region 8 TMS-ISP

Metadata for Toxics Chemical Release Inventory System Locations - Region 8

Table of Contents

Metadata:

Identification_Information

Citation:
Citation_Information:
Originator: US EPA Region 8 TMS-ISP
Publication_Date: 2000
Title: Metadata for Toxic Chemical Release Inventory System Locations - Region 8
Edition: 1.0
Online_Linkage: WWW.EPA.GOV.
Description:
Abstract:
The Region 8 data are located in the ARC/INFO coverage, R8TRI_PTS, which was derived from the Envirofacts point shapefile layer in the National Shapefile Repository. This Repository provides locations of EPA-regulated facilities from

the Oracle table LRT_EF_COVERAGE_SRC, which is located within the Locational Reference Tables (LRT) contained in the Envirofacts (EF) Oracle Database. The spatial extent for this point coverage is the conterminous U.S., Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands. The spatial extent for Region 8 is Colorado, Utah, Wyoming, Montana, North Dakota and South Dakota. Facility data from various EPA program system tables were loaded into the LRT_EF_COVERAGE_SRC table. Only coordinate pairs with the highest accuracy values will represent each facility. The Envirofacts point coverage contains data from the following EPA program systems: AIRS/AFS - Aerometric Information Retrieval System (AIRS) Facility Subsystem, BRS - Biennial Reports System, CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System, PCS - Permit Compliance System, RCRIS - Resource Conservation and Recovery Information System and TRIS - Toxic Release Inventory System
Purpose:
The Region 8 ARC/INFO coverage provides Geographic Information System (GIS) applications with a valuable data layer for base mapping of facilities regulated by EPA.
Supplemental_Information:
Intended use of data: The Region 8 ARC/INFO coverage is intended to be used with Environmental Systems Research Institute, Inc. (ESRI) software-based GIS applications that require access to ARC/INFO coverages containing the geographic location of EPA-regulated facilities. References_Cited: " Design of a National Shapefile Repository, " SDC-0055-091-MM-7092, Environmental Protection Agency, September 25, 1998. " System Design for Maps on Demand EnviroMapper Phase 3, " SDC-0055-091-SI-7107, Environmental Protection Agency, September 25, 1998. Envirofacts Environmental Protection Agency website,
< www.epa.gov/enviro/index_java.html >
Envirofacts Environmental Protection Agency website for Locational Reference Tables
< www.epa.gov/enviro/html/fii/fii_geo.html >
This page contains FGDC GEO Profile compliant metadata
Limitations_of_Data:None. Acknowledgement of the U.S. EPA would be appreciated.
Procedures:
The Region 8 ARC/INFO point coverage is created by the following process: The unique identifiers and positional information are extracted from the LRT_EF_COVERAGE_SRC table in the EF Oracle database and transformed into an ARC/INFO point coverage format. The data are then converted to unprojected ArcView Shapefiles using the ARC/INFO command "arcshape" and then inserted into the National Shapefile Repository at the county and state levels for each state. Local table versions of Region 8 data were produced by creating a database link to enviroep_db and reselecting only Region 8 data from LRT_EF_COVERAGE_SRC, LRT_ADDRESS and LRT_LOC_REF.
Reviews_Applied:

Positional and attribute accuracy are verified by taking independent samples of the data, viewing the data using ArcView, and comparing the displayed data with matching records from Envirofacts. ARC/INFO watch files are created during the extraction of data from the EF Oracle database, processing of the EF data into ARC/INFO point coverages, and conversion from coverages to Shapefiles. These files are created to monitor and verify that the processing occurred without error.
Other_Related_Data_Sets: None.
Notes: None.
Other: None.
Time_Period_of_Content:
Time_Period_Information:
Single_Date_Time:
Calendar_Date: 2000
Multiple_Dates_Times:
Calendar_Date: 1989
Range_of_Dates_Times:
Beginning_Date: 1989
Ending_Date: 2000
Currentness_Reference: December 2000
Status:
Progress: In Work
Maintenance_and_Update_Frequency: Monthly
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -115.4311
East_Bounding_Coordinate: -95.6767
North_Bounding_Coordinate: 48.6076
South_Bounding_Coordinate: 36.9412
Extent: 5724
Data_Set_G-Polygon
Data_Set_G-Polygon_Outer_G-RIng
G-Ring_Latitude:49.1754
G-Ring_Longitude:-115.9884
G-Ring_Latitude:49.9674
G-Ring_Longitude:-95.034
G-Ring_Latitude:48.9674
G-Ring_Longitude:-95.034
G-Ring_Latitude:36.3508
G-Ring_Longitude:-97.1496
G-Ring_Latitude:36.4276
G-Ring_Longitude:-114.309
G-Ring_Latitude:49.1754
G-Ring_Longitude:-115.9884
Keywords:
Theme:
Theme_Keyword_Thesaurus: None

Theme_Keyword: Colorado
Theme_Keyword: Montana
Theme_Keyword: North Dakota
Theme_Keyword: South Dakota
Theme_Keyword: Utah
Theme_Keyword: Wyoming
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: National Shapefile Repository
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: US EPA Region 8 TMS-ISP
Contact_Person: Karl Hermann Contact_Position: Regional GIS Coordinator
Contact_Address:
Address_Type: Mailing
Address: 999 18th Street, Suite 300
City: Denver
State_or_Province: Colorado
Postal_Code: 80202
Country: USA
Contact_Voice_Telephone: 303-312-6628
Contact_Facsimile_Telephone: 303-312-7554
Contact_Electronic_Mail_Address: hermann.karl@epa.gov
Hours_of_Service: Monday_Friday 8-4:30, Mountain Time
Browse_Graphic:
Browse_Graphic_File_Name:
Native_Data_Set_Environment:
Arc/Info Version 8.0.2, Solaris Version 7
Pathname = /ndata1/gisdb/r8/r8_pts/r8pcs_pts

Data_Quality_Information:

Logical_Consistency_Report: Point features present.
Completeness_Report: (See Supplemental_Information)
Lineage:
Process_Step:
Process_Description:
The latitude/longitude attribute values that come from the program system databases may or may not be populated.
Process_Date: 2000

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Albers Conical Equal Area
Albers_Conical_Equal_Area:
Standard_Parallel: 38
Standard_Parallel: 48
Longitude_of_Central_Meridian: -106
Latitude_of_Projection_Origin: 37
False_Easting: 0.00000
False_Northing: 0.00000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: .1
Ordinate_Resolution: .1
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6,378,137
Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:

Detailed_Description:
Entity_Type:
Entity_Type_Label: R8TRI_PTS.PAT
Entity_Type_Definition: Point attribute table for the R8TRI_PTS ARC/INFO points coverage
Entity_Type_Definition_Source: Region 8 GIS Coordinator
Attribute:
Attribute_Label: AREA
Attribute_Definition: ARC/INFO-generated
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PERIMETER
Attribute_Definition:ARC/INFO-generated
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:

Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: R8TRI_PTS#
Attribute_Definition:ARC/INFO-generated
Attribute_Definition_Source: Internal feature number
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: R8TRI_PTS_ID
Attribute_Definition:User-assigned feature number
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: R8_ID
Attribute_Definition: Unique identifier
Attribute_Definition_Source: Region 8 GIS Coordinator
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 6
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_ACRNM
Attribute_Definition: System acronym for source of record
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Program System Abbreviated Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: character ID values

Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LDIP_CODE
Attribute_Definition: System code for source of record
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_ID
Attribute_Definition: Unique ID from respective program system
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Program System Identification Number.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 30
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: FACILITY_NAME
Attribute_Definition: Name of the facility or site
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Facility Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 50
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: FACILITY_UIN
Attribute_Definition: EPA Facility Registry System Unique Identifiers
Attribute_Definition_Source: Envirofacts Development Team, November 1999.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:

Attribute_Label: MAD_ID
Attribute_Definition: Assigned sequential reference number
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: numeric
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LATITUDE
Attribute_Definition: Latitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 11
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LONGITUDE
Attribute_Definition: Longitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Longitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PGM_SYS_LATITUDE
Attribute_Definition: Latitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 11
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:

Attribute_Label: PGM_SYS_LONGITUDE
Attribute_Definition: Longitude of facility, site, or operable unit
Attribute_Definition_Source: Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Longitude Measure
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: Floating value
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: SOURCE_ACRNM
Attribute_Definition: Source Acronym name for borrowed coordinate
Attribute_Definition_Source: Envirofacts Development Team, April 1998
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: SOURCE_ID
Attribute_Definition: Source Identification number for borrowed coordinates
Attribute_Definition_Source: Envirofacts Development Team, April 1998
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: BVFLAG
Attribute_Definition: Indicator of most accurate (" Best Value ") location
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 1
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: MAP_SYMBOL_CODE
Attribute_Definition: Map symbolization code representing source of reco
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:

Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: DERIVED_FIPS_CODE
Attribute_Definition: State/County FIPS code for facility location
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Table
Attribute:
Attribute_Label: DERIVED_CATUNIT
Attribute_Definition: Hydrologic Unit Code (HUC) for facility location
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 8
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: DERIVED_POSTAL_C
Attribute_Definition: Zip code for facility location
Attribute_Definition_Source: U.S. Postal ZIP Code of physical or nearest location (ZIP, or ZIP+4) of the entity / subentity
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LRT_LOC_REF_ID
Attribute_Definition: A sequential reference number assigned to a latitude and longitude coordinate pair.
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 8
Enumerated_Domain_Value_Definition: character ID values

Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: PRIMARY_NAME
Attribute_Definition: Name of regulated or monitored entity / subentity.
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Facility Name
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 50
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: LOCATION_ADDRESS
Attribute_Definition: Street number and address of the entity / subentity.
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: Location Address Text.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 50
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: CITY_NAME
Attribute_Definition: City name for the location of the entity / subentity
Attribute_Definition_Source: United States Postal Service, Address Information Products, Technical Guide, October 1996, Data Element: City State Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 30
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: COUNTY_NAME
Attribute_Definition: County name for the location of the entity / subentity
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: County Name.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 35
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables

Attribute:
Attribute_Label: STATE_CODE
Attribute_Definition: U.S. Post Office state abbreviation of the entity / subentity
Attribute_Definition_Source: Facility Identification Interim Data Standard Memorandum, February 1998, Data Element: State USPS Code.
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: POSTAL_CODE
Attribute_Definition: Zip code for facility location
Attribute_Definition_Source: U.S. Postal ZIP Code of physical or nearest location (ZIP, or ZIP+4) of the entity / subentity
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 14
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Attribute:
Attribute_Label: SUB_ID
Attribute_Definition: Identification for the subentity (ie, monitoring station, spill, pip, stacks, or other operable unit)
Attribute_Definition_Source: Envirofacts Development Team
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: 30
Enumerated_Domain_Value_Definition: character ID values
Enumerated_Domain_Value_Definition_Source: EPA Locational Reference Tables
Overview_Description:
Entity_and_Attribute_Overview: See Entity_and_Attribute_Information
Entity_and_Attribute_Detail_Citation: See Entity_and_Attribute_Information

Distribution_Information:

Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: US EPA Region 8 TMS-ISP
Contact_Person: Karl Hermann Contact_Position: Regional GIS Coordinator
Contact_Address:
Address_Type: Mailing

Address: 999 18th Street, Suite 300
City: Denver
State_or_Province: Colorado
Postal_Code: 80202
Country: USA
Contact_Voice_Telephone: 303-312-6628
Contact_Facsimile_Telephone: 303-312-7554
Contact_Electronic_Mail_Address: hermann.karl@epa.gov
Hours_of Service: Monday-Friday 8-4:30, Mountain Time
Resource_Description: Unknown
Distribution_Liability:
Although these data have been processed successfully on a computer system at the Systems Development Center (SDC), no warranty expressed or implied is made by the EPA regarding the utility of the data on any other system, nor shall the act of distribution constitute any such warranty. Users must assume responsibility to determine the usability of this data for their purposes.

Metadata_Reference_Information:

Metadata_Date: December 2000
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: US EPA Region 8 TMS-ISP
Contact_Person: Karl Hermann
Contact_Address:
Address_Type: Mailing
Address: 999 18th Street, Suite 300
City: Denver
State_or_Province: Colorado
Postal_Code: 80202
Country: USA
Contact_Voice_Telephone: 303-312-6628
Contact_Facsimile_Telephone: 303-312-7554
Contact_Electronic_Mail_Address: herman.karl@epa.gov
Hours_of Service: Monday-Friday 8-4:30, Mountain Time
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 200012
Metadata_Security_Information:
Metadata_Security_Classification_System: N/A
Metadata_Security_Classification: N/A

APPENDIX B-21

METADATA - UNDERGROUND INJECTION CONTROL (UIC) POLYGONS

UIC Polygons

```
Metadata:
 Identification_Information:
  Citation:
   Citation_Information:
    Originator: Wyoming Water Resources Center
    Publication_Date: 1996
    Title: Enhanced Underground Injection Control GIS Database for Wyoming
    Edition: 2
    Geospatial_Data_Presentation_Form: map
    Publication_Information:
      Publication_Place: Laramie, Wyoming
      Publisher: Wyoming Water Resources Center
    Online_Linkage: <a
href="http://www.sdvc.uwyo.edu/clearinghouse/ddmisc.html">Data List</a>

  Description:
    Abstract:
     Contains all wells permitted by Wyoming's Underground Injection Control
     (UIC) program which contain enough information in the permits to be
     locatable.  Scale should be assumed to be approximately 1:100,000 but
     the spatial accuracy of each point varies according to the quality of
     locational information included in the original permits.

    Purpose:
     This dataset was created for the Wyoming Department of Environmental
     Quality (DEQ), Water Quality Division for regional UIC planning purposes.
     It is not intended or suitable for site specific analysis at a scale
     larger than 1:100,000.


  Time_Period_of_Content:
   Time_Period_Information:
    Range_of_Dates/Times:
      Beginning_Date: 1974
      Ending_Date: 1996
   Currentness_Reference: publication date, WY-DEQ sources


  Status:
    Progress: complete
    Maintenance_and_Update_Frequency:
     Changes are made to this dataset as requested by WY-DEQ.  They are
     infrequent and dependent on unallocated discretionary funds becoming
     available.

  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -111.25
      East_Bounding_Coordinate: -103.99999824
      North_Bounding_Coordinate: 45.00000386
      South_Bounding_Coordinate: 40.99999993

  Keywords:
```

```
    Theme:
      Theme_Keyword_Thesaurus:  None
      Theme_Keyword:  Underground Injection Control
      Theme_Keyword:  UIC
      Theme_Keyword:  Wells
      Theme_Keyword:  Injection
    Place:
      Place_Keyword_Thesaurus:  None
      Place_Keyword:  State of Wyoming

  Access_Constraints:
   Access to this dataset is available to the public.  However, to obtain
   the FURS database which contains all attributing information, permission
   must be granted in writing by the Wyoming DEQ/WQD UIC program.

  Use_Constraints:
   This GIS layer should not be used without first relating to the latest
   version of the FURS (Federal UIC Reporting System) database created by the
   UIC Program at WY-DEQ. This database contains detailed information
   about the nature and size of each permit.
   This data is not intended for site specific analysis at a scale larger
   than 1:100,000.


  Point_of_Contact:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: GIS lab coordinator
        Contact_Organization: Wyoming Water Resources Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 3067 University Station
        City: Laramie
        State_or_Province: Wyoming
        Country: USA
        Postal_Code: 82071
      Contact_Voice_Telephone: 307-766-2735
      Contact_Electronic_Mail_Address: n/a
      Hours_of_Service: 8 AM to 5 PM MST

  Browse_Graphic:
    Browse_graphic_file_name: <a
href="http://www.sdvc.uwyo.edu/images/uic.gif">uic.gif</a>
    Browse_graphic_file_description: location of UIC wells in Wyoming
    Browse_graphic_file_type: gif

  Data_Set_Credit:
   If this dataset is used, please reference the Wyoming Water Resources
   Center (creator of the data) and the Wyoming Department of Environmental
   Quality, Water Quality Division (provider of the source files)

  Native_Data_Set_Environment: IRIX64, 6.2, IP25 UNIX, ARC/INFO version 7.0.4

  Cross_Reference:
   Citation_Information:
    Originator: Arneson, C.S. and J.D. Hamerlinck
    Publication_Date: 1996
```

```
    Title: Enhancing Wyoming's UIC Program and GIS
    Series_Information:
      Series_Name: WWRC-96
      Issue_Identification: 14
    Publication_Information:
      Publication_Place: Laramie, Wyoming
      Publisher: Wyoming Water Resources Center
  Cross_Reference:
   Citation_Information:
    Originator: Hamerlinck, J.D., V.R. Hasfurther, and S. Needham
    Publication_Date: 1993
    Title: Development of a UIC Well GIS for Wyoming
    Series_Information:
      Series_Name: WWRC-93
      Issue_Identification: 22
    Publication_Information:
      Publication_Place: Laramie, Wyoming
      Publisher: Wyoming Water Resources Center
  Cross_Reference:
   Citation_Information:
    Originator: Hamerlinck, J.D., D.R. Wrazien and S. Needham
    Publication_Date: 1993
    Title: UIC Database for Groundwater Vulnerability Assesment Applications
    Publication_Information:
      Publication_Place: Atlanta, GA
      Publisher: GIS/LIS
    Other_Citation_Details: GIS/LIS 91 Proceedings

Data_Quality_Information:
 Attribute_Accuracy:
   Attribute_Accuracy_Report:
     The data was reviewed by Robert Lucht, Engineering Supervisor, UIC
     Program, Wyoming Department of Environmental Quality.
   Quantitative_Attribute_Accuracy_Assessment:
     Attribute_Accuracy_Value:  unknown
     Attribute_Accuracy_Explanation:
       Attribute accuracy is described, where present, with each
       attribute defined in the Attribute description in the
       ARC/INFO DOCUMENT table, *.ATT, associated with this dataset.

 Logical_Consistency_Report:  Point features present.

 Completeness_Report:
  All known UIC permits in wyoming with sufficient locational information are
  included.

 Positional_Accuracy:
   Horizontal_Positional_Accuracy:
     Horizontal_Positional_Accuracy_Report:
      Unknown

 Lineage:
  Source_Information:
   Source_Citation:
    Citation_Information:
     Originator: Department of Environment Quality, Cheyenne, Wyoming
     Publication_Date: 1996
```

Title: Water Quality Division, Underground Injection Control Program
Type_Of_Source_Media: paper files
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1974
Ending_Date: 1996
Source_Currentness_Reference: publication date
Source_Citation_Abbreviation: uic file
Source_Contribution: township/range/sections for location
Process_Step:
Process_Description:
The procedures are more completely documented in the final reports for the two projects (Arneson 1996, Hamerlinck 1993a) responsible for the creation of the data. These publications are available from the Wyoming Water Resources Center.
Wyoming DEQ maintains a UIC file for each permitted facility in the state. Each file contains locational information of some sort and of varying quality. Many of these files contain maps showing facility location, but most contain only Township-Range descriptions. Because of this limitation these facilities are only located in the database by nearest Quarter-Quarter section (40 acres). When more detailed maps are available locations were transferred to 1:100,000 scale quadrangle maps and then digitized in ARC/INFO. The maps were paper copies and required to register with an RMS error of less than 0.006 inches.
When wells had to be located using only the Township-Range description the TRLL program written by USGS in Fortran was used. (No reference available) An additional method was used to locate urban permits.
Address matching from TIGER/Line files allowed point locations in the cities of Casper and Cheyenne to be located within their respective city blocks.
Source_Used_Citation_Abbreviation: None
Process_Date: 1993
Process_Step:
Process_Description:
This dataset contains revision 2.0 finalized in 1996. The previous version 1.0 was finalized in 1993 as a final product for the "Development of an Underground Injection Well Geographic Information System for Wyoming"
project. This latest revision adds 129 new permits to the database. These
permits were previously not viewed as UIC facilities.
Source_Used_Citation_Abbreviation: None
Process_Date: 1996

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Point
Point_and_Vector_Object_Count: 509
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 42

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic

```
      Latitude_Resolution: .001
      Longitude_Resolution: .001
      Geographic_Coordinate_Units:  Decimal Degrees
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name:  GRS1980
      Semi-major_Axis: 6378206.4
      Denominator_of_Flattening_Ratio: 294.98

 Entity_and_Attribute_Information:

  Overview_Description:
    Entity_and_Attribute_Overview:
     All attribute information for this dataset is contained in the .PAT
     table.  This table contains locational information in geographic
     coordinates (lat/long) as well as a permit number field.  This field
     is specifically created to join to DEQ's FURS database.
     Attributes: PERMIT_NO (Water Quality Permit Number), X-COORD and Y-COORD
     (latidude and longitude in decimal degrees), DLONG, MLONG AND SLONG
(degrees
     minutes and seconds of longitude), DLAT, MLAT, SLAT (degrees, minutes and
     seconds of latitude), MAPSCALE (scale the data was created at; either
     1:60,000 or 1:100,000).

    Entity_and_Attribute_Detail_Citation: Not Available

 Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Person_Primary:
        Contact_Person: GIS lab coordinator
        Contact_Organization: Wyoming Water Resources Center
      Contact_Address:
        Address_Type: mailing address
        Address: Box 3067 University Station
        City: Laramie
        State_or_Province: Wyoming
        Country: USA
        Postal_Code: 82071
      Contact_Voice_Telephone: 307-766-2735
      Contact_Electronic_Mail_Address: n/a
  Distribution_Liability:
    The distributor shall not be held liable for improper or
    incorrect use of this data, based on the description of
    appropriate/inappropriate used described in this metadata
    document.
    This data was developed and is meant to be used at the
    1:100,000-scale (or smaller scale) for the purpose of
    identifying UIC wells in Wyoming. The distributor
    makes no claims for the data's suitability for other purposes.
  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name: ARCE (Arc/Info export)
        Format_Version_Number: 7.0.4
        Format_Version_Date: 1995
        File_Decompression_Technique:
```

```
        Export file was created using defaults, no compression
      Transfer_size: .13
    Digital_Transfer_Option:
      Online_Option:
        Computer_Contact_Information:
          Network_Address:
            Network_Resource_Name:
              ftp.sdvc.uwyo.edu or http://www.sdvc.uwyo.edu/clearinghouse
        Access_Instructions:
          The data can be accessed online two different way:
          by anonymous ftp or by the world wide web.
          The anonymous ftp server is ftp.sdvc.uwyo.edu,
          and the data is stored in the /pub/gis directory.
          The WWW page is http://www.sdvc.uwyo.edu/clearinghouse.
          Instructions are provided on-line for downloading and
          importing the data.
        Online_Computer_and_Operating_System:
          Both the ftp and WWW server which this data is available
          from is a Silicon Graphics Challenge server, running
          the IRIX 6.2 UNIX operating system.
  Fees:
    No fees are required for downloading the data that is on-line.
    Some fees may be required to cover costs of tapes if data is
    required on tape media.

Metadata_Reference_Information:
 Metadata_Date: 19970616
 Metadata_Contact:
   Contact_Information:
     Contact_Person_Primary:
       Contact_Person: Margo Herdendorf
     Contact_Address:
       Address_Type: mailing address
       Address: Box 3067 University Station
       City: Laramie
       State_or_Province: Wyoming
       Postal_Code: 82071
       Country: USA
     Contact_Voice_Telephone: 307-766-2735
     Contact_Electronic_Mail_Address: meh@uwyo.edu
 Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
 Metadata_Standard_Version: 19940608
```

APPENDIX B-22

METADATA - WATERSHEDS

Hydrologic Unit Codes – HUC Level 6

Identification_Information:
  Citation:
    Citation_Information:
      Originator: Wyoming Geographic Information Science Center
      Publication_Date: 20020328
      Publication_Time: Unknown
      Title: Wyoming Hydrologic Unit Boundaries to the 6th Level at 1:24,000-scale
      Edition: 1
      Geospatial_Data_Presentation_Form: vector digital data
      Publication_Information:
        Publication_Place: University of Wyoming, Laramie
        Publisher: Wyoming Geographic Information Science Center
      Online_Linkage: www.wygisc.uwyo.edu/clearinghouse/watershed.html
  Description:
    Abstract:
      This data set is a complete digital hydrologic unit boundary layer to the Subwatershed (12-digit) 6th level for the State of Wyoming.This data set consists of geo-referenced digital data and associated attributes created in accordance with the "Federal Standards For Delineation of Hydrologic Unit Boundaries 12/06/01"
      (http://www.ftw.nrcs.usda.gov/huc_data.html). The data set was developed by digitizing watershed boundary lines using 1:24,000 Enhanced Digital Raster Graphics (DRG-E) geo-referenced topographic image base maps and 1:100,000-scale draft boundary lines. The National Elevation Dataset (NED) was used to produce the 1:100,000-scale preliminary draft boundaries. Polygons are attributed with hydrologic unit codes for 4th level sub-basins, 5th level watersheds, 6th level subwatersheds, name, size, downsteam hydrologic unit, type of watershed, non-contributing areas and flow modification. Arcs are attributed with the highest hydrologic unit code for each watershed, linesource and a metadata reference file.
      Two separate shapefiles were created for downloading purposes. One with arcs (wy_hu12arc.shp) and one with polygons (wy_hu12poly.shp). The same metadata is used for both shapefiles. Only the arc attributes will be found in the wy_hu12arc shapefile. Similarly, only the poly attributes will be found in the wy_hu12poly shapefile.
    Purpose: The Watershed and Subwatershed hydrologic unit boundaries provide a uniquely identified and uniform method of subdividing large drainage areas. The smaller sized 6th level sub-watersheds (up to 250,000 acres) are useful for numerous application programs supported by a variety of local, State, and Federal Agencies. This data set is intended to be used as a tool for water-resource management and planning activities, particularly for site-specific and localized studies requiring a level of detail provided by large-scale map information. The dataset will be appended to a larger seamless nationally consistant geospatial database as other states complete their portion of the watershed boundary dataset. Two separate shapefiles were created for downloading purposes. One with arcs (wy_hu12arc.shp) and one with polygons (wy_hu12poly.shp). The same metadata is used for both shapefiles. Only the arc attributes will be found in the wy_hu12arc shapefile. Similarly, only the poly attributes will be found in the wy_hu12poly shapefile.
  Time_Period_of_Content:
    Time_Period_Information:
      Range_of_Dates/Times:

Beginning_Date: 199910
Ending_Date: 200203
Currentness_Reference: ground condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: Unknown
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111.581155
East_Bounding_Coordinate: -103.259794
North_Bounding_Coordinate: 46.375323
South_Bounding_Coordinate: 40.526556
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: HUC
Theme_Keyword: Hydrologic Units
Theme_Keyword: Watershed Boundaries
Theme_Keyword: Subwatershed Boundaries
Theme_Keyword: WBD
Theme_Keyword: HUB
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: WY
Place_Keyword: MT
Place_Keyword: ND
Place_Keyword: SD
Place_Keyword: NE
Place_Keyword: CO
Place_Keyword: UT
Place_Keyword: ID
Access_Constraints: None
Use_Constraints: The distributor shall not be held liable for improper or incorrect use of this data, based on the description of appropriate/inappropriate uses described in this metadata document. It is strongly recommended that this data is directly acquired from the distributor and not indirectly through other sources which may have changed the data in some way. These data should not be used at scales greater than 1:24,000 for the purpose of identifying hydrographic watershed boundary feature locations in Wyoming. WyGISC (Wyoming Geographic Information Science Center) makes no claims for the data's suitability for other purposes. WyGISC should be acknowledged as the data source in products derived from these data. The Wyominig Watershed Boundary Dataset is public information and may be interpreted by all organizations, agencies, units of government, or others based on needs; however, they are responsible for the appropriate application of the data. Federal, State, or local regulatory bodies are not to reassign to the WyGISC or the Natural Resources Conservation Service any authority for the decisions they make. The Natural Resources Conservation Service will not perform any evaluations of these maps or purposes related solely to State or local regulatory programs. Photographic or digital enlargement of these maps to scales greater than that at which they were originally delineated can result in misrepresentation of the data. If enlarged, the maps will not include the fine detail that would be appropriate for mapping at the small scale. Digital data files are periodically updated. Files are dated, and users are responsible for obtaining the latest version of the data from the source distributor.
Point_of_Contact:
Contact_Information:

Contact_Organization_Primary:
Contact_Organization: Wyoming Geographic Information Science Center
Contact_Person: Wendy Berelson
Contact_Position: Assistant Research Scientist
Contact_Address:
Address_Type: mailing address
Address: P.O. Box 4008
City: Laramie
State_or_Province: WY
Postal_Code: 82071-4008
Contact_Voice_Telephone: (307) 766-2735
Contact_Facsimile_Telephone: (307) 766-2744
Contact_Electronic_Mail_Address: berelson@uwyo.edu
Hours_of_Service: 9:00-5:00
Contact_Instructions: Please email questions and requests.

Data_Set_Credit: Funding for the Wyoming Watershed Boundary Datasete (WBD) was provided by the Wyoming Department of Environmental Quality (DEQ) and the US Bureau of Land Management (BLM). Representatives from the DEQ, BLM, National Resource Conservation Service (NRCS), and the US Geological Survey (USGS) contributed a substantial amount of time and salary towards quality review of the dataset. Additionally, completion of the WBD has involved an extensive collaborative effort between WyGISC and numerous representatives from the DEQ, BLM and individual Field Offices, NRCS and individual Conservation Districts, US Forest Service and individual Forests, the Wyoming State Engineer's Office and individual Water Divisions, the Wind River Indian Reservation Tribal Council, and adjacant state agencies.

Security_Information:
Security_Classification_System: n/a
Security_Classification: Unclassified
Security_Handling_Description: n/a

Native_Data_Set_Environment: Microsoft Windows 2000 Version 5.0 (Build 2195) Service Pack 3; ESRI ArcCatalog 8.2.0.700

Cross_Reference:
Citation_Information:
Originator: Wyoming Geographic Information Science Center
Publication_Date: 2002
Publication_Time: Unknown
Title: Wyoming Watershed Boundary Dataset
Edition: 1
Geospatial_Data_Presentation_Form: vector digital data
Publication_Information:
Publication_Place: University of Wyoming, Laramie
Publisher: Wyoming Geographic Information Science Center
Online_Linkage: http://www.wygisc.uwyo.edu/clearinghouse/

Data_Quality_Information:

Attribute_Accuracy:
Attribute_Accuracy_Report:
The accuracy of this data is dependent on the level of detail of the source material and the interprtation procedures for capturing that source. The primary limiting factor for the level of detail of the source is the scale (1:24,000) of the enhanced digital raster graphic (DRG-E). The map scale determines the level of content that may be extracted from the given source during digitization.

It should be noted that no 1:24,000-scale linework was available for the Black Buttes DRG-E (USGS Quad Id # 41008-E5). Boundary locations were determined using the 1:100,000-scale DRG-E and the digital orthophoto quads. The following

huc_12s intersect the black buttes quad: 140401050203, 140401050205, 140401050206, 140401050207.

1) 100% of the boundary locations were visually verified using the draft 1:100,000-scale boundaries and the enhanced digital raster graphics (DRG-E) as a reference. Additionally, 10% of the boundary locations were reviewed by the Interagency Hydrologic Unit Group (IHUG). Ocassionally (<5%) local knowledge was used to verify boundary locations or digital orthophoto quads of the area were reviewed.

2) 100% of the huc_12, huc_10 and huc_8 values were verified visually for accuracy upon attribute transfer from the 1:100,000-scale draft data and then again once the entire coverage was complete. The huc_12 values were also checked to ensure no duplicate numbers were found

3) 100% of the state attribute was visually checked.

4) The ncontrb_a areas were first identified during the creation of the 1:100,000-scale data. Areas larger than 3000-acres were attributed as noncontributing hydorlogic units. 100% of the noncontributing area were verified using the DRG-Es during the naming process.

5)The hu_10_ds and hu_12_ds were visually verified using the national hydrographic dataset and where necessary, the DRG-E.

6) The huc_10_name and hu_12_name attributes were checked for duplicates and to ensure that the names comply with the Federal Standards for the Delineation of Hydrologic Unit Boundaries.

7) The hu_10_mod and hu_12_mod attributes were visually verified for accuracy of interbasin transfers during the semi-automated attribution process. Dam locations were identified by looking at the NHD waterbodies in each huc_8 and comparing the pour point locations of the huc_8 boundaries.

8) 100% of the hu_10_type and hu_12_type attributes were visually verified.

Logical_Consistency_Report: There are no unclosed polygons, intersections without nodes, or polygons without labels or with more than one label. Arc/Info's topological checking program CLEAN was used to correct intersections without nodes, identify unclosed polygons and remove duplicate lines with the same beginning and ending nodes. All sliver polygons were removed either using eliminate, merge or manually in ArcEdit.

Completeness_Report:

All fields for all polygons in the .pat are attributed. Some polygons in the Ncontrb_a field might have a 0 value. All fields for the lines in the .aat are attributed. The lines adjacent to the universal polygon are attributed with a 0 for the hu_level. These cannot be attributed until the adjacent states complete their linework at which point the hightest level of hydrologic unit can be determined.

It should be noted that no 1:24,000-scale linework was available for the Black Buttes DRG-E (USGS Quad Id #41008-E6). Boundary locations were determined using the 1:100,000-scale DRG-E and the digital orthophoto quads. The following huc_12s intersect the Black Buttes quad: 140401050203, 140401050205, 140401050206, 140401050207.

The WBD was produced using Enhanced Digital Raster Graphics (DRG-Es) digital images as source map. Data completeness for DRG files reflect content of the source graphic and may therefore be reflected in the completeness and accuracy of the WBD.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The map was digitized from USGS 1:24,000-scale digital raster graphic base maps, with an inherited error of +/- 40 feet according to USGS National Map

Accuracy Standards. Digitized line locations were held to the +/- 40 foot accuracy standards by ensuring that all lines were within a 12 meter buffer of where visual interpretion put the actual boundary. Any lines outside the buffer were corrected. It is estimated that the errors detected were less than 10%. It should be noted that while general rules of hydrology were used (i.e. water flows downhill), the location of boundaries is still somewhat subjective as the 1:24,000-scale DRG-E do not always provide enough information for identifying the location of the boundaries. In these instances group consensus was used. Please refer to the methods section for more details on watershed delineation rules. Unquantifiable errors may be associated with coordinate shift (fuzzy tolerance was set to 0.000000001 meters, double precision), dangle (set to 15 meters). The default was used for all other ArcEdit tolerances.

It should be noted that the data was digitzed using NAD27 horizontal datum as that is the native datum of the digital raster geographics. The data was then projected to NAD83 horizontal datum as requested by the NRCS.

If the Wyoming data is reprojected to nad83 and overlaid on the DRG-Es with the NAD83 DRG-Es it can be assumed that the boundaries will be off by less than 2 meters. As with the original DRGs, DRG-E is cast in the Universal Transverse Mercator projection and is referenced to the NAD27 datum. When the drg-es are used in the NAD83 datum the alternate world files only approximate the NAD83 by shifting the coordinates of the imagery. The total error introduced using this shift is less than 2 meters for all DRG-E imagery.

```
    Vertical_Positional_Accuracy:
      Vertical_Positional_Accuracy_Report: N/A
  Lineage:
    Source_Information:
      Source_Citation:
        Citation_Information:
          Originator: Beartooth Mapping, Red Lodge MT
          Publication_Date: 19990301
          Title: Enhanced Digital Raster Graphic
          Edition: 1
          Geospatial_Data_Presentation_Form: raster digital data
          Online_Linkage: www.beartoothmaps.com
      Source_Scale_Denominator: 24
      Type_of_Source_Media: CD-ROM
      Source_Time_Period_of_Content:
        Time_Period_Information:
          Single_Date/Time:
            Calendar_Date: variable
        Source_Currentness_Reference: ground condition
      Source_Citation_Abbreviation: DRG-E
      Source_Contribution: The DRG-Es are the digital representation of the USGS
7.5min quadrangles. They were used as a backdrop to do on-screen digitizing of
the watershed boundaries at 1:24k scale
    Process_Step:
      Process_Description:
        1) Phase I - Draft Delineations at 1:100,000-scale
        a) In ArcInfo Using blind pass processing on the USGS National Elevation
Dataset (NED) 5000 pixel catchments were created
        b) Using the guidelines for creating watersheds outlined in the Federal
Standards the NED derived watersheds were aggregated using tools created in
ArcView. Reference Data included 1:100,000-scale National Hyrodgraphy Dataset
reach code and 100K Digital Line Graph Hydrography (Strahler Order) and existing
linework from USFS, NPS and adjacent states.
        c) The aggregated watersheds were attributed using tools created in
ArcView. The attributes include 4th level/8 digit, 5th level/10 digit and 6th
```

level/12 digit hydrologic Unit Codes (HUC). Comments regarding necessary editing (e.g. pourpoint adjustment) were also added with tools.

d) Edit and dissolve NED derived sheds on 5th and 6th level HUCs

e) Draft boundaries were reviewed and edits suggested by the Interagency Hydrologic Unit Group, neighboring states and other cooperators.

f) Edits were made to the draft boudaries

g) The final draft boundaries were checked for size appropriateness, pour point locations, and HUC attribute according to the Federal Standards.

2) Phase II - 1:24,000-scale delineations

a) Using the draft boudaries as a guide and the Digital Raster Graphics - Enhanced (DRG-E) as a background the

1:24,000-scale boudaries were digitized as a shapefile using head-up digitizing in ArcView. Digitizing usually occured zoomed in at 1:7,000-1:12,000-scale. The general watershed boundary delineation rules used to digitize the watershed boundaries include: 1) drawing boundaries perpendicular to contours, 2) never crossing a waterbody or where contours indicate the location of overland flow would go (except as a pourpoint) and 3) when delineating along a ridgetop the boundary would be located closer to the side of the ridge with the steepest gradient. It should be noted that while general rules of hydrology were used the location of boundaries is still somewhat subjective as the 1:24,000-scale DRG-E do not always provide enough information for identifying the location of the boundaries in such instances group consensus was used. HUC 14040106 was digitzed by the United States Geolgic Survey in Utah. All of the steps noted below were carried out on the line work completed by Utah.

b) All 1:24,000-scale linework was reviewed internally and corrections made accordingly.

c) 10% of the 1:24,000-scale linework was then reviewed by the Interagency Hydrologic Unit Group (IHUC).

d) The shapefile was converted to a polygon coverage in ArcInfo

e) Topology was created in Arc/Info using CLEAN a dangle length of 15 and a fuzzy tolerance of 0.000000001. The coverage was created using double precision.

f) The draft 1:100,000-scale boundaries were converted to a polygon coverage and cleaned using defaults

g) Attributes from the 100,000k draft were transfered to the 1:24,000-scale coverage using the PUT command

h) Additional attributes were added using some extensions and scripts created in ArcView. These included the HucNamer extension, the downstream HUC tool, flow modification NHD query tool.

i)The remaining attributes required by the Federal Standard were added by querying the appropriate data in ArcView.

Process_Date: 20020329
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Wendy Berelson
Contact_Organization: Wyoming Geographic Information Science Center
Contact_Position: Assistant Research Scientist
Contact_Address:
Address_Type: mailing address
Address: P.O. Box 4008
City: Laramie
State_or_Province: WY
Postal_Code: 82071-4008
Country: USA
Contact_Voice_Telephone: 307-766-2735
Contact_Facsimile_Telephone: 307-766-2744

```
          Contact_Electronic_Mail_Address: berelson@uwyo.edu
          Hours_of_Service: 9-5
    Process_Step:
      Process_Description: Dataset copied.
      Source_Used_Citation_Abbreviation: z:\wbd\coverages\final\wy_hu12
Spatial_Data_Organization_Information:
  Direct_Spatial_Reference_Method: Vector
  Point_and_Vector_Object_Information:
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: Complete chain
      Point_and_Vector_Object_Count: 14937
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: Label point
      Point_and_Vector_Object_Count: 2687
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
      Point_and_Vector_Object_Count: 2687
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: Point
      Point_and_Vector_Object_Count: 4
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: Label point
      Point_and_Vector_Object_Count: 0
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: Composite object
      Point_and_Vector_Object_Count: 101
    SDTS_Terms_Description:
      SDTS_Point_and_Vector_Object_Type: Composite object
      Point_and_Vector_Object_Count: 647
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Geographic:
      Latitude_Resolution: 0.000000
      Longitude_Resolution: 0.000000
      Geographic_Coordinate_Units: Decimal degrees
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name: Geodetic Reference System 80
      Semi-major_Axis: 6378137.000000
      Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
  Detailed_Description:
    Entity_Type:
      Entity_Type_Label: wy_hu12.aat
      Entity_Type_Definition: identifies watershed boundaries
      Entity_Type_Definition_Source: n/a
    Attribute:
      Attribute_Label: FID
      Attribute_Definition: Internal feature number.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Sequential unique whole numbers that are
automatically generated.
    Attribute:
      Attribute_Label: Shape
      Attribute_Definition: Feature geometry.
      Attribute_Definition_Source: ESRI
```

```
      Attribute_Domain_Values:
        Unrepresentable_Domain: Coordinates defining the features.
    Attribute:
      Attribute_Label: FNODE#
      Attribute_Definition: Internal node number for the beginning of an arc
(from-node).
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Whole numbers that are automatically generated.
    Attribute:
      Attribute_Label: TNODE#
      Attribute_Definition: Internal node number for the end of an arc (to-
node).
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Whole numbers that are automatically generated.
    Attribute:
      Attribute_Label: LPOLY#
      Attribute_Definition: Internal node number for the left polygon.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Whole numbers that are automatically generated.
    Attribute:
      Attribute_Label: RPOLY#
      Attribute_Definition: Internal node number for the right polygon.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Whole numbers that are automatically generated.
    Attribute:
      Attribute_Label: LENGTH
      Attribute_Definition: Length of feature in internal units.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Positive real numbers that are automatically
generated.
    Attribute:
      Attribute_Label: WY_HU12#
      Attribute_Definition: Internal feature number.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Sequential unique whole numbers that are
automatically generated.
    Attribute:
      Attribute_Label: WY_HU12-ID
      Attribute_Definition: User-defined feature number.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
        Unrepresentable_Domain: Sequential unique whole numbers that are
automatically generated.
    Attribute:
      Attribute_Label: HU_LEVEL
      Attribute_Definition: The highest hydrologic unit level (smallest number)
for the line (arc) represented by the record
      Attribute_Definition_Source: Federal Standards for Delineation of
Hydrologic Unit Boundaries
      Attribute_Domain_Values:
        Codeset_Domain:
```

```
          Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit
Boundaries
          Codeset_Source: Please refer to the Entity and Attribute Overview for
valid values
    Attribute:
      Attribute_Label: LINESOURCE
      Attribute_Definition: The base map source(s) used to delineate at 1:24,000
scale
      Attribute_Definition_Source: Federal Standards for Delineation of
Hydrologic Unit Boundaries
      Attribute_Domain_Values:
        Codeset_Domain:
          Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit
Boundaries
          Codeset_Source: Please refer to the Entity and Attribute Overview for
valid values
    Attribute:
      Attribute_Label: META_ID
      Attribute_Definition: Metadata ID is a code that identifies which metadata
file applies to the arc
      Attribute_Definition_Source: Federal Standards for Delineation of
Hydrologic Unit Boundaries
      Attribute_Domain_Values:
        Codeset_Domain:
          Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit
Boundaries
          Codeset_Source: Please refer to the Entity and Attribute Overview for
valid values
    Attribute:
      Attribute_Label: HU_10_DS
    Attribute:
      Attribute_Label: HU_10_NAME
    Attribute:
      Attribute_Label: HU_10_MOD
    Attribute:
      Attribute_Label: HU_10_TYPE
    Attribute:
      Attribute_Label: HU_12_DS
    Attribute:
      Attribute_Label: HU_12_NAME
    Attribute:
      Attribute_Label: HU_12_MOD
    Attribute:
      Attribute_Label: HU_12_TYPE
    Attribute:
      Attribute_Label: HU_2_NAME
    Attribute:
      Attribute_Label: HU_4_NAME
    Attribute:
      Attribute_Label: HU_6_NAME
    Attribute:
      Attribute_Label: HU_8_NAME
  Detailed_Description:
    Entity_Type:
      Entity_Type_Label: wy_hu12.pat
      Entity_Type_Definition: polygons identify watershed boundaries
      Entity_Type_Definition_Source: n/a
```

Attribute:
Attribute_Label: FID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.
Attribute:
Attribute_Label: AREA
Attribute_Definition: Area of feature in internal units squared.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Positive real numbers that are automatically generated.
Attribute:
Attribute_Label: PERIMETER
Attribute_Definition: Perimeter of feature in internal units.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Positive real numbers that are automatically generated.
Attribute:
Attribute_Label: WY_HU12#
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: WY_HU12-ID
Attribute_Definition: User-defined feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: HUC_8
Attribute_Definition: A unique 8-digit code from the USGS map series "Hydrologic Unit Maps". The same number should be used in every record that pertains to a subwatershed that resides within the same 8-digit sub-basin.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Unrepresentable_Domain: Positive real numbers that are automatically generated.
Attribute:

Attribute_Label: HUC_10
Attribute_Definition: This field provides a unique 10-digit code for each watershed. Add two digits to the end of the existing 8-digit code, therefore resulting in a 10-digit number. This same number should be used in every record that pertains to a subwatershed that resides within the same 10-digit watershed.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: HUC_12
Attribute_Definition: This field provides a unique 12-digit code for each subwatershed. Add two digits to the end of the existing 10-digit code, therefore creating a 12-digit number.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: ACRES
Attribute_Definition: Area of subwatershed including non-contributing areas calculated to acres as a whole number, no decimals. Data was projected to Albers Equal Area to calculate the acres field. Acres were calculated by dividing area by 4046.86 (This equation was provide by the NRCS-NCGC).
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: STATES
Attribute_Definition: The "States" field needs to include the names of all state(s) that the subwatershed falls within.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: NCONTRB_A

Attribute_Definition: Drainage areas that do not flow toward the outlet of any hydrologic unit are considered non-contributing. Only isolated non-contributing areas larger than 3,000 acres were delineated and their acreage noted in this field
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_10_DS
Attribute_Definition: The 10-digit code of the 5th level hydrologic unit that is receiving the majority of the flow from the watershed that the 6th level HU falls within. Outlets created by ditching or other artificial drainage are not to be considered for this field.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_10_NAME
Attribute_Definition: A unique name for each 5th level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_10_MOD
Attribute_Definition: This field identifies interbasin transfers (IT) and dams at outlet (DM) that modify natural overland flow as Modifications are identified from most significant to least significant modification(s) and are based on a query of hydrologic units using the 1:100,000-scale National Hydrography Dataset. Hydrologic units with no modification are marked with NM.
Attribute_Definition_Source: Modification by Wyoming Geographic Information Science to the Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_10_TYPE

Attribute_Definition: This field identifies the type of watershed.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_12_DS
Attribute_Definition: The 12-digit code of the 5th level hydrologic unit that is receiving the majority of the flow from the watershed that the 6th level HU falls within. Outlets created by ditching or other artificial drainage are not to be considered for this field.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_12_NAME
Attribute_Definition: A unique name for each 6th level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_12_MOD
Attribute_Definition: This field identifies interbasin transfers (IT) and dams at outlet (DM) that modify natural overland flow as Modifications are identified from most significant to least significant modification(s) and are based on a query of hydrologic units using the 1:100,000-scale National Hydrography Dataset. Hydrologic units with no modification are marked with NM.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_12_TYPE
Attribute_Definition: This field identifies the type of watershed.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:

Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_2_NAME
Attribute_Definition: A unique name for each 1st level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_4_NAME
Attribute_Definition: A unique name for each 2nd level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_6_NAME
Attribute_Definition: A unique name for each 3rd level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values
Attribute:
Attribute_Label: HU_8_NAME
Attribute_Definition: A unique name for each 4th level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Overview_Description:
Entity_and_Attribute_Overview:
Description of attributes by field from the Federal Standards for Delineation of Hydrologic Unit Boundaries
1) .pat attributes

Huc_8 : Eight Digit Hydrologic Unit Code - (REQUIRED)
A unique 8-digit code from the USGS map series "Hydrologic Unit Maps". Use the existing code for the sub-basin where the subwatershed resides; do not change this code. The same number should be used in every record that pertains to a subwatershed that resides within the same 8-digit sub-basin.Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion.

Huc_10: Ten Digit Hydrologic Unit Code - (REQUIRED)
This field provides a unique 10-digit code for each watershed. Add two digits to the end of the existing 8-digit code, therefore resulting in a 10-digit number. This same number should be used in every record that pertains to a subwatershed that resides within the same 10-digit watershed.Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion. It should be noted that the polygons that cross into Idaho were numbered by Idaho and are not consistent with the above methods. Affected huc_8s include: 17040202, 17040204 and 17040104.

Huc_12: Twelve Digit Hydrologic Unit Code - (REQUIRED)
This field provides a unique 12-digit code for each subwatershed. Add two digits to the end of the existing 10-digit code, therefore creating a 12-digit number.Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion. It should be noted that the polygons that cross into Idaho were numbered by Idaho and are not consistent with the above methods. Affected huc_8s include: 17040202, 17040204 and 17040104.

Acres: Acres - (REQUIRED)
Area of subwatershed including non-contributing areas calculated to acres as a whole number, no decimals. The "Acres" field needs to be calculated from the "Area" field.

States: States - (REQUIRED)
The "States" field needs to include the names of all state(s) that the subwatershed falls within. Use the 2-digit postal abbreviation in upper case and sort the state(s) in alphabetical order. If using more then one abbreviation, separate with a comma with no space after the comma.

Ncontrb_a: Non-Contributing Area - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)
Drainage areas that do not flow toward the outlet of any hydrologic unit are considered non-contributing. If a non-contributing area is on the boundary between two or more hydrologic units, determine the low point along the non-contributing area boundary. The non-contributing area should be associated with the hydrologic unit adjacent to the low point on the boundary. This attribute should be the total of the non-contributing areas within a hydrologic unit calculated in acres.

Hu_10_ds: Fifth Level Downstream Hydrologic Unit Code - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

Populate this field with the 10-digit code of the 5th level hydrologic unit that is receiving the majority of the flow from the watershed that the 6th level HU falls within. Outlets created by ditching or other artificial drainage are not to be considered for this field. If an HU flows into an ocean or the Gulf of Mexico populate this field with "OCEAN" and if a HU flows into one of the Great Lakes use the term "LAKE". If a HU flows across international borders use "CANADA" or "MEXICO" depending on which country the HU drains into. If an HU is a closed basin, then populate this record with the term "CLOSED BASIN".

Hu_10_name: Fifth Level Hydrologic Unit Name - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

This field is for officially recognized names only. Populate this field by following the directions in subsection 6.3 "Watershed and Subwatershed Naming Protocol". Populate this field with the identical name for all 6th level hydrologic units that fall within the same 10-digit HU. The name used to attribute the watershed should be used only once within a 4th level unit. Some 10-digit HU were assigned the huc_10 number when no GNIS name was identified on the DRG-Es.

Hu_10_mod: Fifth Level Hydrologic Unit Modifications - (REQUIRED)

This field should identify any type of modifications to natural overland flow that alters the location of the hydrologic unit boundary for a 10-digit watershed. In the attribute field, identify from most significant to least significant modification(s). Use one or more of the following abbreviations in uppercase to identify your modification(s). If using more then one abbreviation, separate with a comma with no space after the comma.

SC - Stormwater Canal
ID - Irrigation Ditch
IT - Interbasin Transfer
BC - Barge Canal
SD - Stormwater Ditch
PD - Pipe Diversion
CD - Channel Diversion
NC - Non-Contributing
KA - Karst
LE - Levee
NM - No Modifications
OC - Overflow Channel
DM - Dam at outlet or HU boundary
OT - Other

Hu_10_type: Fifth Level Hydrologic Unit Type - (REQUIRED)

Populate this field with the hydrologic unit type from the list provided that most closely identifies the watershed. Use any of the one-digit abbreviations in uppercase that is provided in the list.

S - "Standard" hydrologic unit - Any land HU with drainage flowing to a single outlet point, excluding non-contributing areas. This includes areas or small triangular wedges between adjacent HU's that remain after classic hydrologic units are delineated. Some examples include "true", "classic", "composite", and "remnant" hydrologic units.

C - "Closed Basin" hydrologic unit - A drainage area that is 100% non-contributing. This means all surface flow is internal, no overland flow leaves the hydrologic unit through the outlet point.

F - "Frontal" hydrologic unit - Areas along the coastline of lakes, oceans, bays, etc. that have more than one outlet. These HU's are predominantly land with some water areas at or near the outlet(s).

W - "Water" hydrologic unit - Hydrologic units that are predominantly water with adjacent land areas, ex. lake, easturies, harbors.

I - "Island" hydrologic unit - A hydrologic unit that is one or more islands and adjacent water out to the toe of the shore face.

U - "Unclassified" hydrologic unit - A hydrologic unit that can't be defined or doesn't fit into one of the types that have been listed.

Hu_12_ds: Sixth Level Downstream Hydrologic Unit Code - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

Populate this field with the 12-digit code of the 6th level hydrologic unit that is receiving the majority of the flow from the subwatershed. Outlets created by ditching or other artificial drainage are not to be considered for this field. If a HU flows into an ocean or the Gulf of Mexico populate this field with "OCEAN" and if a HU flows into one of the Great Lakes use the term "LAKE". If a HU flows across international borders use "CANADA" or "MEXICO" depending on which country the HU drains into. If an HU is a closed basin, then populate this record with the term "CLOSED BASIN".

Hu_12_name: Sixth Level Hydrologic Unit Name - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

This field is for officially recognized names only. Populate this field by following the directions in subsection 6.3 "Watershed and Subwatershed Naming Protocol". The name used to attribute the subwatershed should be used only once within a 6th level unit. Some 10-digit HU were assigned the huc_12 number when no GNIS name was identified on the DRG-Es.

Hu_12_mod: Sixth Level Hydrologic Unit Modifications - (REQUIRED)

This field should identify any type of modifications to natural overland flow that alters the location of the hydrologic unit boundary for a 12-digit subwatershed. In the attribute field, identify from most significant to least significant modification(s). Use one or more of the following abbreviations in uppercase to identify your modification(s). If using more than one abbreviation, separate with a comma with no space after the comma.

SC - Stormwater Canal
ID - Irrigation Ditch
IT - Interbasin Transfer
BC - Barge Canal
SD - Stormwater Ditch
PD - Pipe Diversion
CD - Channel Diversion
NC - Non-Contributing
KA - Karst
LE - Levee
NM - No Modifications
OC - Overflow Channel
DM - Dam at outlet or HU boundary
OT - Other

Hu_12_type: Sixth Level Hydrologic Unit Type - (REQUIRED)

Populate this field with the hydrologic unit type from the list provided that most closely identifies the subwatershed. Use any of the one digit abbreviations in uppercase that is provided in the list.

S - "Standard" hydrologic unit - Any land HU with drainage flowing to a single outlet point, excluding non-contributing areas. This includes areas or small triangular wedges between adjacent HU's that remain after classic

hydrologic units are delineated. Some examples include "true", "classic", "composite", and "remnant" hydrologic units.

C - "Closed Basin" hydrologic unit - A drainage area that is 100% non-contributing. This means all surface flow is internal, no overland flow leaves the hydrologic unit through the outlet point.

F - "Frontal" hydrologic unit - Areas along the coastline of lakes, oceans, bays, etc. that have more than one outlet. These HU's are predominantly land with some water at or near the outlet(s).

W - "Water" hydrologic unit - Hydrologic units that are predominantly water with adjacent land areas, ex. lake, easturies.

I - "Island" hydrologic unit - A hydrologic unit that is one or more islands and adjacent water out to the toe of the shore face.

U - "Unclassified" hydrologic unit - A hydrologic unit that can't be defined or doesn't fit into one of the types that have been listed.

ArcInfo (.pat) and ArcView Polygon Format

Item name	Width	Output	Type	(ArcView)	N.Dec.	Example
Huc_8	8	8	C		-	01080201
Huc_10	10	10	C		-	0108020103
Huc_12	12	12	C		-	010802010310
Acres	8	12	F	N	0	026739
States	11	11	C		-	KS,MO,OK
Ncontrb_a	8	12	F	N	0	357
Hu_10_ds	10	10	C		-	1710020504
Hu_10_name	80	80	C	-		Upper Blue River
Hu_10_mod	20	20	C	-		CB,NC,ID
Hu_10_type	1	1	C	-		S
Hu_12_ds	12	12	C	-		171002050402
Hu_12_name	80	80	C	-		Drift Creek-Big Bear River
Hu_12_mod	20	20	C	-		SD,KA,PD
Hu_12_type	1	1	C	-		C

2) .aat attributes

Hu_level: Hydrologic Unit Level - (REQUIRED)

This field provides the means to create cartographically pleasing maps. Populate this field with the highest hydrologic unit level (smallest number) for the line (arc) represented by the record. Record the level using numbers 1 through 6 representing each level with 1 being the highest and 6 the lowest level. An example would be if a line represents a region, subregion, basin, subbasin, watershed, and subwatershed boundary, then this cell would be populated with a 1 (Region). Example two would be if a line is a subbasin, watershed, and subwatershed boundary, then the cell would get a 4 (Subbasin). Use one of the levels provided in the list below.

Level	Digit#	Name
1	2	Region
2	4	Subregion
3	6	Basin
4	8	Subbasin
5	10	Watershed
6	12	Subwatershed

Linesource: Line Spatial Data Source - (REQUIRED)

The Linesource should indicate the base map source(s) used to delineate at 1:24,000 scale. Populate the field using one of the standardized code(s) listed

below in uppercase. If using more than one code, separate with a comma with no space after the comma.

TOPO24 - Delineation from hardcopy 1:24,000 scale topographic maps

TOPO25 - Delineation from hardcopy 1:25,000 topgraphic maps, only Alaska and Caribbean

TOPO63 - Delineation from hardcopy 1:63,360 topographic maps, only Alaska and Caribbean

DRG24 - Delineation from 1:24,000 scale Digital Raster Graphics

DRG25 - Delineation from 1:25,000 Digital Raster Graphics, only Alaska and Caribbean

DRG63 - Delineation from 1:63,360 Digital Raster Graphics, only Alaska and Caribbean

DEM10 - Derived from 10 meter Digital Elevation Model

DEM30 - Derived from 30 meter Digital Elevation Model

NED30 - Derived from 30 meter National Elevation Dateset Model

EDNA30 - (formally NED-H), derived from 30 meter Elevation Derivatives for National Applications

BATH"scale" (ex. BATH24) - Interpreted from NOAA 1:24,000 scale bathymetric data

HYPSO"scale" (ex. HYPSO24)- Delineated from 1:24,000 scale contour data

ORTHO"scale" (ex. ORTHO12) - Interpreted from 1:12,000 scale Ortho-imagery

DEDEM10 - Drainage enforced 10 meter Digital Elevation Model

DEDEM30 - Drainage enforced 30 meter Digital Elevation Model

GPS - Derived from Global Positioning System

LIDAR - Derived from LIDAR

IFSAR - Derived from IFSAR data

OTH - Other

UNK - Unknown

All other reference and source maps not listed should be noted in the metadata.

Meta_id: Metadata ID Number - (REQUIRED)

Metadata ID is a code that identifies which metadata file applies to the arc. In many cases there will only be one metadata file. However, in some cases more than one metadata file may be created to identify different groups and/or procedures used to produce the lines. These separate metadata files may be identified for each separate arc. The metadata ID should be a 4-character code starting with the 2-letter state postal code, followed by a 2-digit sequence number. For example "OK01", "ID02", etc.

ArcInfo Line (.aat) Attribute Format

Item name	Width	Output	Type	N.Dec.	Example
Hu_level	1	1	I	-	6
Linesource	20	20	C	-	DEM30,DRG24,GPS
Meta_id	4	4	C	-	OK01

Entity_and_Attribute_Detail_Citation: Federal Standard for Delineation of Hydrologic Unit Boundaries

Distribution_Information:

Distributor:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Wendy Berelson

Contact_Organization: Wyoming Geographic Information Science Center - Univ. of Wyoming

Contact_Address:

Address_Type: mailing address

Address: P.O. Box 4008
City: Laramie
State_or_Province: WY
Postal_Code: 82071-4008
Country: USA
Contact_Voice_Telephone: 307-766-2735
Contact_Facsimile_Telephone: 307-766-2744
Contact_Electronic_Mail_Address: berelson@uwyo.edu
Hours_of_Service: 9-5
Contact_Instructions: please e-mail with data requests.
Resource_Description: Downloadable Data
Distribution_Liability: The distributor shall not be held liable for improper or incorrect use of this data, based on the description of appropriate/inappropriate uses described in this metadata document. It is strongly recommended that this data is directly acquired from the distributor and not indirectly through other sources which may have changed the data in some way. These data should not be used at scales greater than 1:24,000 for the purpose of identifying hydrographic watershed boundary feature locations in Wyoming. WyGISC (Wyoming Geographic Information Science Center) makes no claims for the data's suitability for other purposes. WyGISC should be acknowledged as the data source in products derived from these data. The Wyominig Watershed Boundary Dataset is public information and may be interpreted by all organizations, agencies, units of government, or others based on needs; however, they are responsible for the appropriate application of the data. Federal, State, or local regulatory bodies are not to reassign to the WyGISC or the Natural Resources Conservation Service any authority for the decisions they make. The Natural Resources Conservation Service will not perform any evaluations of these maps or purposes related solely to State or local regulatory programs. Photographic or digital enlargement of these maps to scales greater than that at which they were originally delineated can result in misrepresentation of the data. If enlarged, the maps will not include the fine detail that would be appropriate for mapping at the small scale. Digital data files are periodically updated. Files are dated, and users are responsible for obtaining the latest version of the data from the source distributor.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ARCE
File_Decompression_Technique: no compression applied
Transfer_Size: 29.529
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: wy_hu12
Online_Computer_and_Operating_System: www.wygisc.uwyo.edu/clearinghouse
Fees: none
Ordering_Instructions: Download from the website www.wygisc.uwyo.edu/clearinghouse.html or e-mail requests.
Metadata_Reference_Information:
Metadata_Date: 20030421
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Wendy Berelson

Contact_Organization: Wyoming Geographic Information Science Center at the University of Wyoming
Contact_Position: Assistant Research Scientist
Contact_Address:
Address_Type: mailing address
Address: P.O. Box 4008
City: Laramie
State_or_Province: WY
Postal_Code: 82071
Country: USA
Contact_Voice_Telephone: 307-766-2735
Contact_Facsimile_Telephone: 307-766-2744
Contact_Electronic_Mail_Address: berelson@uwyo.edu
Hours_of_Service: 8-5 (school year): 7:30-4:30 (summer)
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

APPENDIX B-23

METADATA - WYOMING OIL AND GAS CONSERVATION COMMISSION (WOGCC) WELLS

WOGCC Wells

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Wyoming Oil and Gas Conservation Commission
Publication_Date: October 2003
Title: WyOGCC_Wells
Edition: 1.0
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: \\dc1\swap\GIS\GIS2\PSOCs\WyOGCC\WyOGCC_Wells.shp
Description:
Abstract:
Well Permits from the Wyoming Oil and Gas Conservation Commission
Purpose:
This dataset was designed to represent Oil and Gas drilling within Wyoming
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: October 2003
Currentness_Reference: publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -111.045739
East_Bounding_Coordinate: -104.010933
North_Bounding_Coordinate: 45.002048
South_Bounding_Coordinate: 40.998558
Keywords:
Theme:
Theme_Keyword_Thesaurus: PSOC
Theme_Keyword: Oil Well

Theme_Keyword: Natural Gas Well
Theme_Keyword: Coal Bed Methane
Theme_Keyword: WOGCC Permits
Place:
Place_Keyword: Wyoming
Access_Constraints: None.
Use_Constraints: Please contact WyOGCC
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Kim Parker
Contact_Organization: Wyoming Dept. of Environmental Quality
Contact_Position: Program Specialist
Contact_Address:
Address_Type: mailing and physical address
Address: Herschler Building, 4th West
Address: 122 W 25th Street
City: Cheyenne
State_or_Province: Wyoming
Postal_Code: 82002
Country: USA
Contact_Voice_Telephone: 307-777-7343
Contact_Facsimile_Telephone: 307-777-5973
Contact_Electronic_Mail_Address: kparke@state.wy.us
Hours_of_Service: 8-5 MST
Data_Set_Credit: Wyoming Oil and Gas Conservation Commission
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment:
Microsoft Windows 2000 Version 5.1 (Build 2600) Service Pack 1; ESRI ArcCatalog 8.3.0.800

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Attributes are assumed to be as accurate as the source information provided by Wyoming Oil and Gas Conservation Commission.
Logical_Consistency_Report:
The accuracy of this dataset varies according to the source information.
Completeness_Report: Complete.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
Horizontal accuracy varies according to the scale of the source data. Contact the Wyoming Oil and Gas Conservation Commission for more information.
Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report: None.
Lineage:
Source_Information:
Source_Scale_Denominator: Unknown
Type_of_Source_Media: CD-ROM
Source_Citation_Abbreviation: WyOGCC
Source_Contribution:
Trihydro used the information from the Wyoming Oil and Gas Conservation Commission without change.
Process_Step:
Process_Description:
Please refer to the Wyoming Oil and Gas Conservation Commission.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Entity point
Point_and_Vector_Object_Count: 96337

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.000000
Longitude_Resolution: 0.000000
Geographic_Coordinate_Units: Decimal degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222

Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: WyOGCC_Wells
Attribute:
Attribute_Label: FID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.

Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.
Attribute:
Attribute_Label: OBJECTID
Attribute:
Attribute_Label: APINO
Attribute:
Attribute_Label: COUNTY
Attribute:
Attribute_Label: PERMIT
Attribute:
Attribute_Label: COMPANY
Attribute:
Attribute_Label: WN
Attribute:
Attribute_Label: FIELD_NAME
Attribute:
Attribute_Label: SEC
Attribute:
Attribute_Label: TWP
Attribute:
Attribute_Label: T_DIR
Attribute:
Attribute_Label: RGE
Attribute:
Attribute_Label: R_DIR
Attribute:
Attribute_Label: QTR1
Attribute:
Attribute_Label: QTR2
Attribute:
Attribute_Label: LAND_TYPE
Attribute:
Attribute_Label: LON
Attribute:
Attribute_Label: LAT
Attribute:
Attribute_Label: WELL_CLASS
Attribute:
Attribute_Label: STATUS
Attribute:
Attribute_Label: COAL_BED
Attribute:
Attribute_Label: BOTFORM
Attribute:

Attribute_Label: SYMBOL
Attribute:
Attribute_Label: CTY
Attribute:
Attribute_Label: CSYM
Attribute:
Attribute_Label: PSOC_NAME
Attribute:
Attribute_Label: PSOC_TYPE
Attribute:
Attribute_Label: PSOC_COMME
Attribute:
Attribute_Label: PSOC_INT_I
Overview_Description:
Entity_and_Attribute_Overview:
Descriptive information for each PSOC as well as an Internal ID that allows a user to reference back to WDEQ or EPA's original source data if a question arises.

Distribution_Information:
Resource_Description:
Please refer to the Wyoming Oil and Gas Conservation Commission.
Distribution_Liability:
Please refer to the Wyoming Oil and Gas Conservation Commission.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 43.590

Metadata_Reference_Information:
Metadata_Date: 20040630
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Chris Arneson
Contact_Organization: Trihydro Corporation
Contact_Position: GIS Hydrologist/EMIS Manager
Contact_Address:
Address_Type:
REQUIRED: The mailing and/or physical address for the organization or individual.
City: REQUIRED: The city of the address.
State_or_Province: REQUIRED: The state or province of the address.
Postal_Code: REQUIRED: The ZIP or other postal code of the address.
Contact_Voice_Telephone: 307-745-7474
Contact_Facsimile_Telephone: 307-745-7729
Contact_Electronic_Mail_Address: carneson@trihydro.com

Hours_of_Service: 8-5 MST
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None.
Metadata_Use_Constraints: None.
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

Generated by mp version 2.8.6 on Thu Oct 04 12:34:09 2007

APPENDIX C

GIS APPLICATION USER'S GUIDE

GIS APPLICATION USERS MANUAL
WYOMING SOURCE WATER PROTECTION PROJECT
REQUIRED SOFTWARE:
ESRI ARCGIS ARCVIEW 9.0

June 30, 2004

Project #: 424-001

PREPARED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

PREPARED FOR: WDEQ

Trihydro CORPORATION

ENGINEERING SOLUTIONS. ADVANCING BUSINESS.

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Table of Contents

1.0 INTRODUCTION

The Wyoming Department of Environmental Quality (DEQ) contracted and worked closely with Trihydro Corporation (Trihydro) and Lidstone and Associates, Inc. (Lidstone) to complete source water assessments for 389 public water supplies (PWSs)[1]. Trihydro and Lidstone were selected because of their geologic experience, Geographic Information System (GIS) expertise, and their knowledge of many PWSs in Wyoming. PWS delineations were completed by the firm most familiar with the geology/hydrology of the area.

Water system susceptibility is related to three factors which were evaluated as part of this source water assessment. The first was the physical integrity of the well, intake, and conveyances. The second was the sensitivity of the land area through which potential contaminants may reach the well or intake, including the geologic, hydrologic, and land cover characteristics of the watershed, well location, or aquifer source area. The third was the nature of the potential contaminants. Potential contaminants include specific point sources and any land uses that may contribute contaminants to the water supply. For point sources, the type of potential contaminants, the location of the contaminant sources relative to the well or intake, and confirmation of a contaminant release were also considered.

Data used to quantitatively evaluate the susceptibility of each water source to potential contaminants were acquired from sources readily available for PWSs in Wyoming. The delineated source water areas, DEQ contaminant inventories, 1:500,000-scale land use maps compiled by the University of Wyoming, US Environmental Protection Agency (EPA) sanitary surveys, EPA's Safe Drinking Water Information System database, and DEQ and Wyoming State Engineer's Office (SEO) well or intake permits were used to determine the susceptibility of each PWS.

The project results included 389 individual PWS Susceptibility and a custom ArcGIS-based custom GIS application. The GIS application was developed within ArcView v9.0 and customized utilizing Visual Basic for Applications (VBA) programming. Additionally Crystal Reports v10 was utilized to create the individual susceptibility reports. The specific purpose of the application was to allow a user to add or update PWS well or intake information and then easily produce a final susceptibility report for the PWS. While Trihydro project staff were the initial users of the application while finalizing the project's 389 PWS reports, future users will include any individual or entity that wishes to update a previous report or develop a new one.

This user's manual was created to help a potential SWAP user create Source Water Assessment Reports for newly signed-up systems, as well as make modifications to existing systems. This manual contains instructions on adding or changing existing PWSs, as well as re-scoring the system to produce the susceptibility reports. The GIS application

[1] A complete discussion of this project and its results can be found in Trihydro's final project report to DEQ.

functionality is described along with instructions on using each tool to step through the susceptibility scoring process. This document does not include any information about creating source water delineations for new or modified PWSs. It is assumed that for new or modified systems, appropriate delineations will be provided to the Source Water Assessment and Protection (SWAP) program by the PWS or a qualified consultant.

2.0 DATA AND SYSTEM STRUCTURE

There are several components of the SWAP GIS application that require digital files to be stored in a specific location and structure in order to function properly through the susceptibility scoring process. The Microsoft Access database (**SWAP.mdb**) has been designed to hold the information for each PWS and well/intake. This data is used in the modeling process, as well as the scoring process. The GIS source water delineation files also require a specific structure. A **Delineations** directory stores PWS source water delineations, which are organized by PWS identification number. Each PWS has its own directory. Within a specific PWS directory, the next level of directories is organized by type such as **Groundwater**, **Surface Water**, **CFR**, and **GeoMapping**. Each of these directories holds delineation GIS shapefiles[2] defined in Lat/Long (Geographic NAD83) coordinates. Any changes or additions to this structure should mirror the data stored for previously completed delineations. The ArcView-based GIS application uses the **SWAP.mdb** database to store information and to hold the final scoring data. The GIS also uses the delineations to calculate the score by spatially joining it to the **Land Use**, **PSOC – points**, and **PSOC – lines** layers. Any changes made to this data structure should be made with care and with appropriate backups.

[2] Shapefile format is one of the native file formats of ArcGIS. A shapefile actually consists of 3-6 separate files (ex: *.shp, *.dbf, *.shx) that share a common prefix.

3.0 CUSTOM GIS APPLICATION

Final project deliverables include a customized ArcView-based GIS application to run the susceptibility score for each well and intake. This tool also produces and prints the final susceptibility reports and maps. To do this, Trihydro chose ESRI's ArcView 9.0 as the GIS software and created a set of custom tools for the DEQ. Additionally Crystal Reports v10 was utilized to create the final PWS reports.

The customized toolbar within the SWAP ArcView 9.0 application contains six customized tools specific for the SWAP project. These tools are designed to complete the editing and scoring of susceptibility data for each well or intake. Additionally, a report dialog has been developed for producing complete susceptibility reports, susceptibility summary reports, and well/intake information sheets. The fourth option from the reporting dialog will set up PWS maps for printing/plotting.

The toolbar shown below is the **SWAP Susceptibility** toolbar created within ArcView. Each tool is explained in detail in the following text. This toolbar is only available in the **SWAP.mxd** application. In conjunction with the toolbar, an initialize (*.ini) file is included in the same directory at the **SWAP.mxd** application. Always named the same prefix as its reference ArcView application (**SWAP.ini** in this case), this INI file contains information such as database paths and layout parameters. In the event that any of the data sources are renamed or moved to a different computer, a user may need to edit this INI file using a standard text editor.

APPLICATION OPENING:

Every time the **SWAP.mxd** application is opened, it connects to the project database (**SWAP.mdb** in this case) and creates a layer showing the PWS systems and locations.

3.1 ADDING OR MODIFYING PWS INFRASTRUCTURE

Adding information to the SWAP application should be done with great care. It is strongly recommended that before any data is modified that a complete project backup be performed.

3.1.1 SETTING UP A NEW PWS

This section details instructions to set up a new PWS for source water analysis. Two steps are required prior to susceptibility scoring. The first is entering the specific well and intake data into the **SWAP.mdb** database. The second is to import delineation and sanitary survey data into the GIS structure.

1. *In the Database*: Add the new record to the [**tblPWS Systems**] table in the **SWAP.mdb** database. Fill in the ID, PWS name, and other information available. ** If the PWS already exists in the table, proceed to Step 2.

2. *In the Database*: Add a new record for each well to the [**tblWells**] data. Required information includes *PWS Id*, *Well Id*, *latitude*, and *longitude*. These fields are necessary for the final susceptibility scoring to function properly. Fill in the columns with available data and groundwater modeling information for each well.

3. *GIS*: Place the Zone 1, 2, and 3 shapefiles from the delineation model into the appropriate directory under the **Delineations** directory. View the folder structure for other systems to ensure the names are correct on all directories and shapefiles. **The GIS assumes that input shapefiles are in Geographic NAD83 coordinates.

4. *GIS*: Open up the **SWAP.mxd** GIS project.

5. *GIS*: Use the **Edit Susceptibility** form to enter the sanitary survey information into the database. This will prepare the well for scoring. These tools are described further in the Susceptibility Scoring section of this document.

6. *GIS*: Run the **Scoring Susceptibility** form for each of the new wells.

7. *GIS*: Run the **SWAP Report** function to see the scoring results.

3.1.2 MODIFYING AN EXISTING PWS AND/OR WELL

Database: Update the record for each PWS that needs to changed in the [**tblPWS Systems**] table in the **SWAP.mdb** database.

1. *Database*: Update the record for each well that needs changed in the [**tblWells**] table in the **SWAP.mdb** database.

2. *GIS*: If the delineations have changed, update the Zone 1, 2, or 3 in the appropriate **Delineations** directory. If no changes have been made to the delineations, proceed to the next step.

3. *GIS*: Open up the **SWAP.mxd** GIS project.

4. *GIS*: Use the **Edit Susceptibility** form to change any sanitary survey information in the database. This will prepare the well for scoring.

5. *GIS*: Run the **Scoring Susceptibility** form for each of the wells or intakes that had a data change.

6. *GIS*: Run the **SWAP Report** function to see the scoring results.

3.2 SUSCEPTIBILITY SCORING

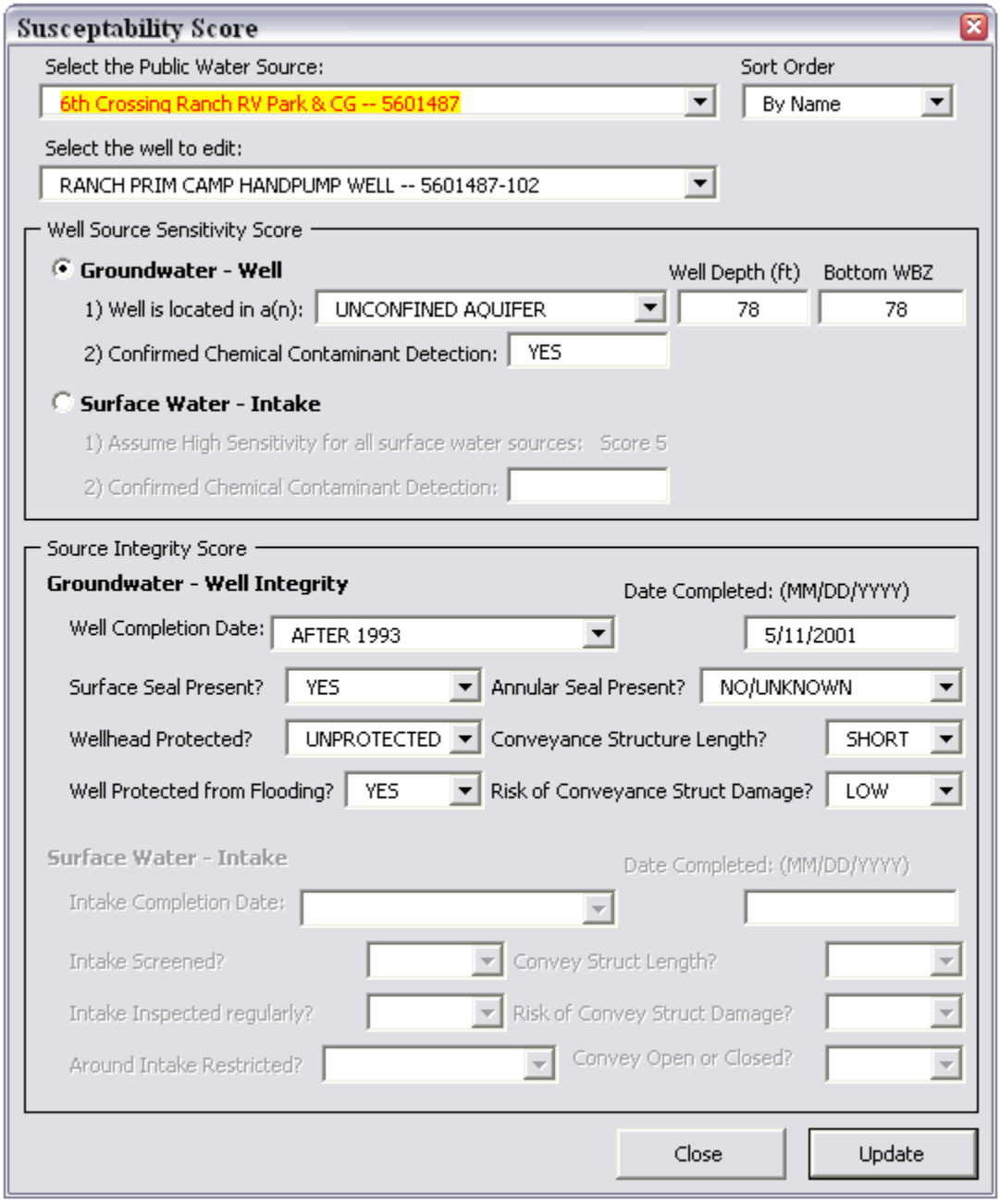
3.2.1 EDITING EXISTING SCORING DATA

The [**Edit Susceptibility**] button will open the **Edit Susceptibility** form, which is shown below. This form is used in the entering and/or the editing of Sanitary Survey information for each well/intake.

3.3 PSOC LAYERS

3.3.1 MODIFYING PSOC LAYERS

PSOC features can be added, updated, or removed from the three PSOC layers by any competent GIS professional familiar with ArcView. No customized tools have been created to aid in this process however. Features are currently divided into separate GIS layers based on geometry (points, lines, and polygons). Great care should be taken to examine and understand the data structure and metadata before making any modifications. The custom GIS application's reporting tools expect this very specific data format and may fail if the [PSOC_NAME], [RELEASE], and [CONTRISK] fields are not fully and correctly populated. It is strongly recommended that before modifying any layers, backups be created.



* The Edit Susceptibility form has the [**Update**] button

1. Open the form.

2. Select the Public Water System in the PWS dropdown box. This dropdown box is sorted by PWS name. In order to resort by number, select **<By Number>** in the Sort Order dropdown box.

3. Select the well to edit from the Well dropdown box. This will load the form up with the well's information. If the dropdown/text boxes are empty, then there was no information entered for the well.

4. Use the dropdowns or text boxes to enter the sanitary survey information. The information in the dropdown boxes is very specific to the scoring process. The ***Select the Well to Edit*** input box on the form is automatically filled in with information from the SDWIS table located in the SWAP.mdb database.

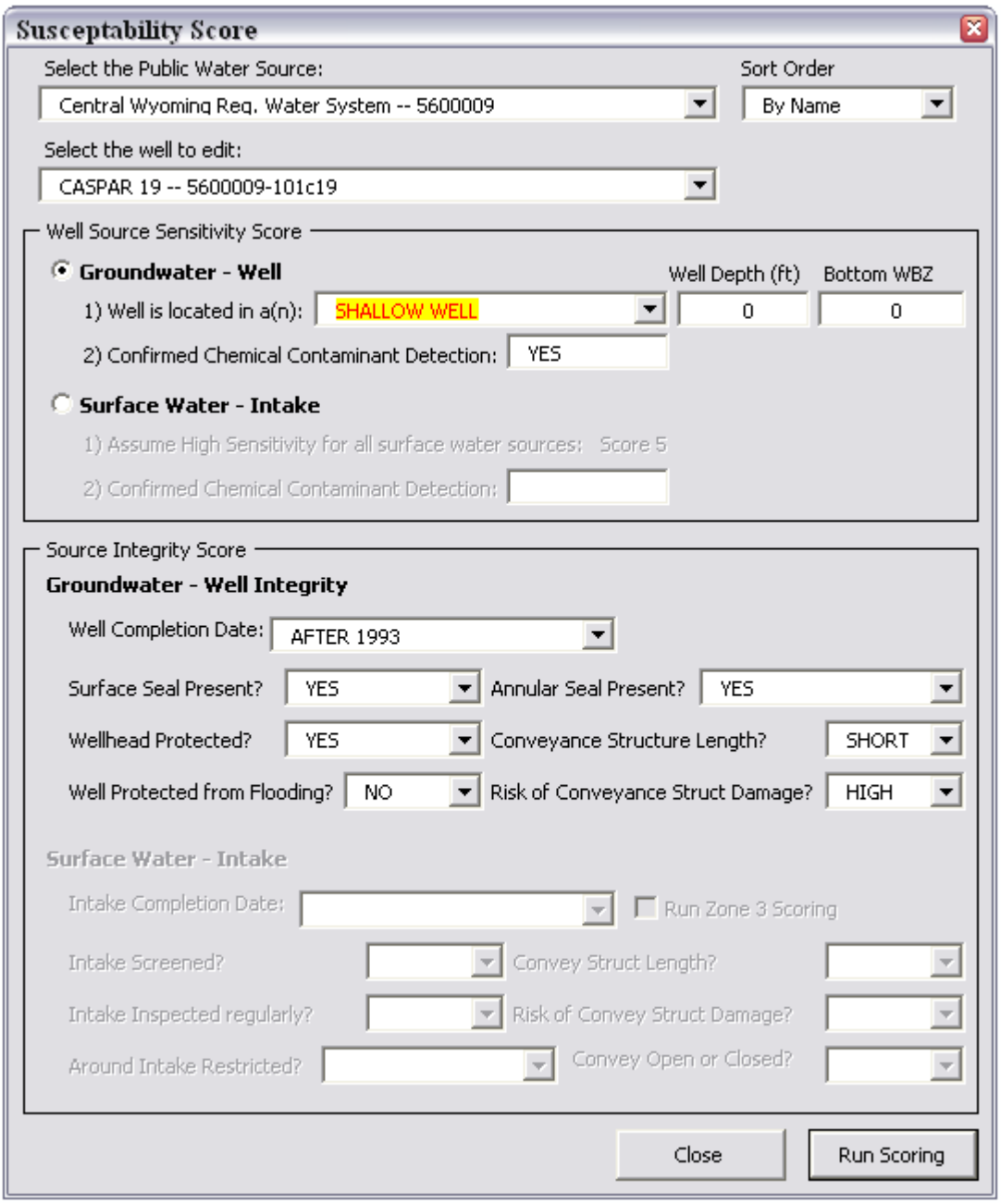
5. After entering the information, click the [**Update**] button. This will write the data to the database.

NOTES: **If the [**Update**] button is not clicked, the data will NOT be saved to the database.

**If no data is entered in the dropdown boxes, the program will default to the highest possible scoring value.

3.3.2 TO RUN THE SUSCEPTIBILITY SCORE

In order to run the susceptibility scoring on a well or intake, the sanitary survey information must be entered into the database using the **Edit Susceptibility** form. Only after information is entered can the scoring process be run for each well/intake. The process behind the scoring application is included in the final SWAP report and in each PWS susceptibility report. Depending on the size of the delineations, the scoring process can take up to 10 minutes. This form will shut down after the scoring is complete.



* The Run Susceptibility form has the [**Run Scoring**] button

1. Open the form by clicking on the [**Run Susceptibility**] button.

2. Select the Public Water System in the PWS dropdown box. This dropdown box is sorted by PWS name. In order to resort by number, select **<By Number>** in the Sort Order dropdown box.

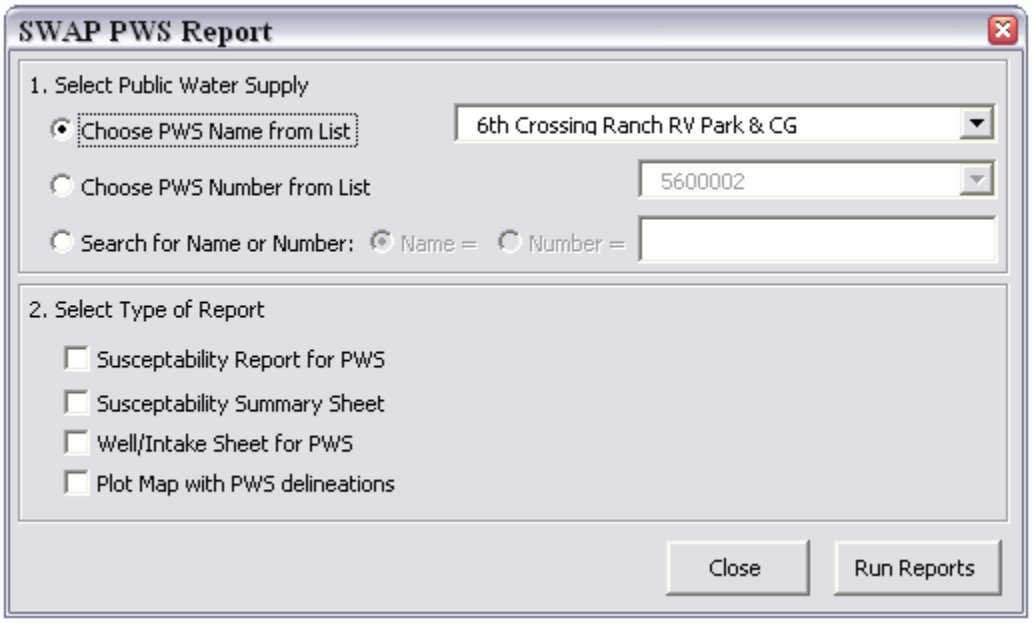
3. Select the well to edit from the Well dropdown box. This will load the form up with the well's information. If the dropdown/text boxes are empty, then there was no information entered for the well.

4. Click the [**Run Scoring**] button to start the process.

NOTES ** To run Surface Water Zone 3, click on the **<Run Zone 3 Scoring>** checkbox. By default, only PSOCs within Zone 1 and Zone 2 will be scored on surface water delineations. Due to the large area that can be covered by the large surface water zone 3s, the process will capture many PSOCs that are not relevant to the scoring intake, as well as unnecessarily increasing computational processing time. The **<Run Zone 3 Scoring>** option is available specifically for the smaller surface water zone 3s. In the final project susceptibility reports, the project team scored the zone 3 delineations for all springs.

3.4 CREATING SOURCE WATER ASSESSMENT REPORTS

Four reports can be produced using the SWAP Report custom tool in the ArcView application. The user can produce the following reports: **Susceptibility Report**, a shorter **Susceptibility Summary Report**, full **Well/Intake Information Sheets**, and plot **Delineation Maps** for a PWS. Prior to running the reports, the scoring must be complete in order to produce the scoring tables. Prior to producing maps with this dialog, the delineations must be created and stored in the folder. The report dialog box is shown below. It has two dropdown boxes to easily provide access to any individual PWS. A search function is also included, which allows a user to search either by PWS name or number. Instructions are included below for running the reports.

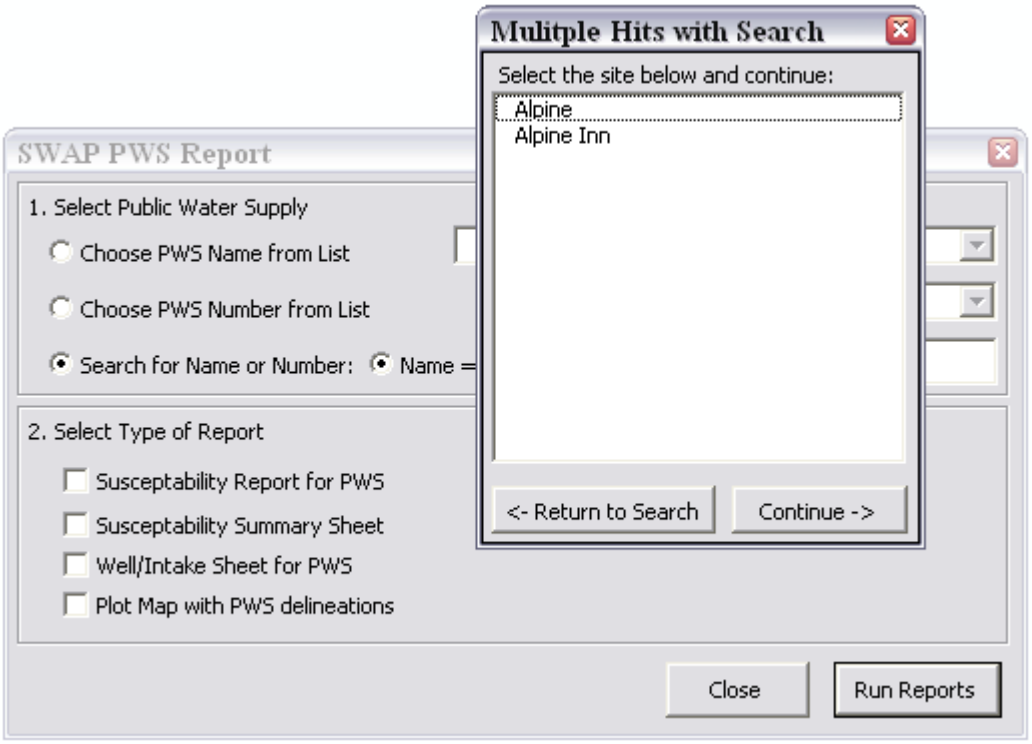


3.4.1 PRODUCING REPORTS

The following section details how to create the following reports:

- Susceptibility report
- Susceptibility summary report
- Well/intake information sheets

1. Open the SWAP report dialog box by clicking on the [**SWAP Report**] button.
2. Select a PWS from the first dropdown to select by name. Use the second dropdown box to select a PWS by number.
    a. To use the search option, first select the **<Search for Name or Number>** option, and then choose to search by either **<Name>** or **<Number>.** Next, enter the text or number for the search.
    b. If one PWS is selected by the search criteria, it will automatically use that PWS. However, if there are multiple results, the Multiple Hits with Search dialog will appear.
    c. If multiple results are retrieved, choose the correct PWS system and click **<Continue>**. If the correct results were not retrieved, click [**Return to Search]** to return to the SWAP Report dialog.

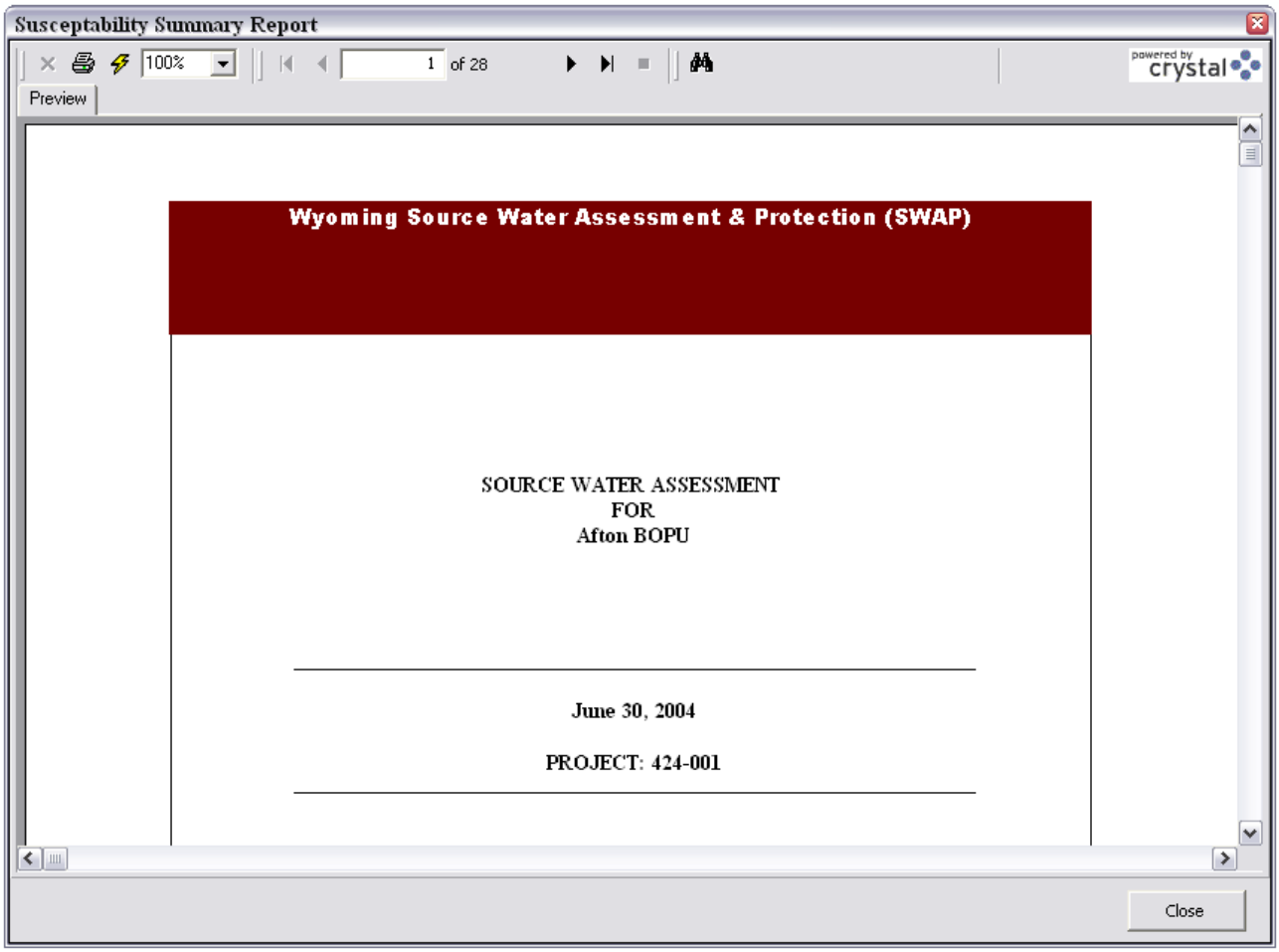


1. Select one or more of the report types by clicking on the checkbox next to the report type. At least one report type must be chosen before continuing.

2. Click [**Run Reports**] button to run the reports. An example of the report dialog box is below.

3. From the **SWAP PWS Report** dialog box, a report can be viewed and/or printed.

4. Close the Report dialog box by clicking on the [**Close**] button. This will allow the program to run the next report selected.



3.4.2 DELINEATION MAPS:

The fourth report option is to <**Plot PWS with Delineation**>. This option will create and format the map layout for the user, including the loading of the appropriate delineations. Before the mapping option can format the layout, the user must choose the appropriate printer for the map. The Printer Dialog box shows all available printers and paper sizes for the individual printers available on the local computer.

1. Open the SWAP report dialog box by clicking on the [**SWAP Report]** button.

2. Select a PWS from the first dropdown to select by name. Use the second dropdown box to select a PWS by number.

a. To use the search option, first select the **<Search for Name or Number>** option and then choose to search by either **<Name>** or **<Number>**. Next, enter the text or number for the search.

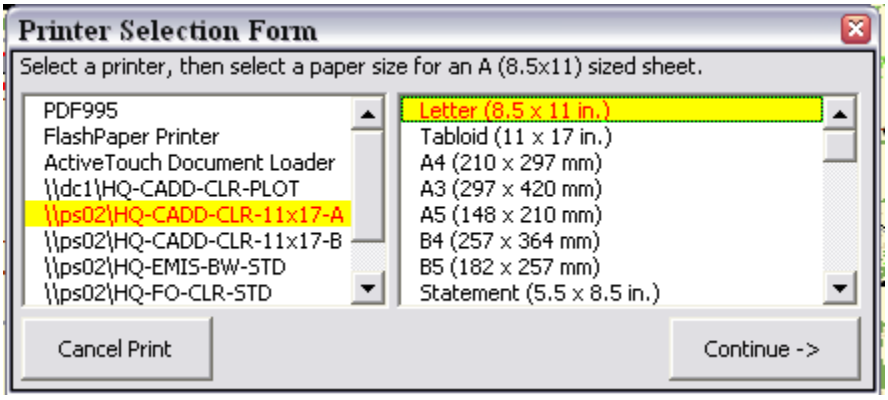
b. If one PWS is selected by the search criteria, it will automatically use that PWS. However, if there are multiple results, the **Multiple Hits with Search** dialog will appear.

c. If multiple results. Choose the correct PWS system and click [**Continue**]. If these are not the results sought, click [**Return to Search]** to return to the **SWAP PWS Report** dialog.

3. Select the **<Plot PWS with Delineations>** option by clicking on the checkbox next to the report type. At least one report type must be chosen before continuing.

4. Click [**Run Reports]** button to run the reports. An example of the report dialog box is below.

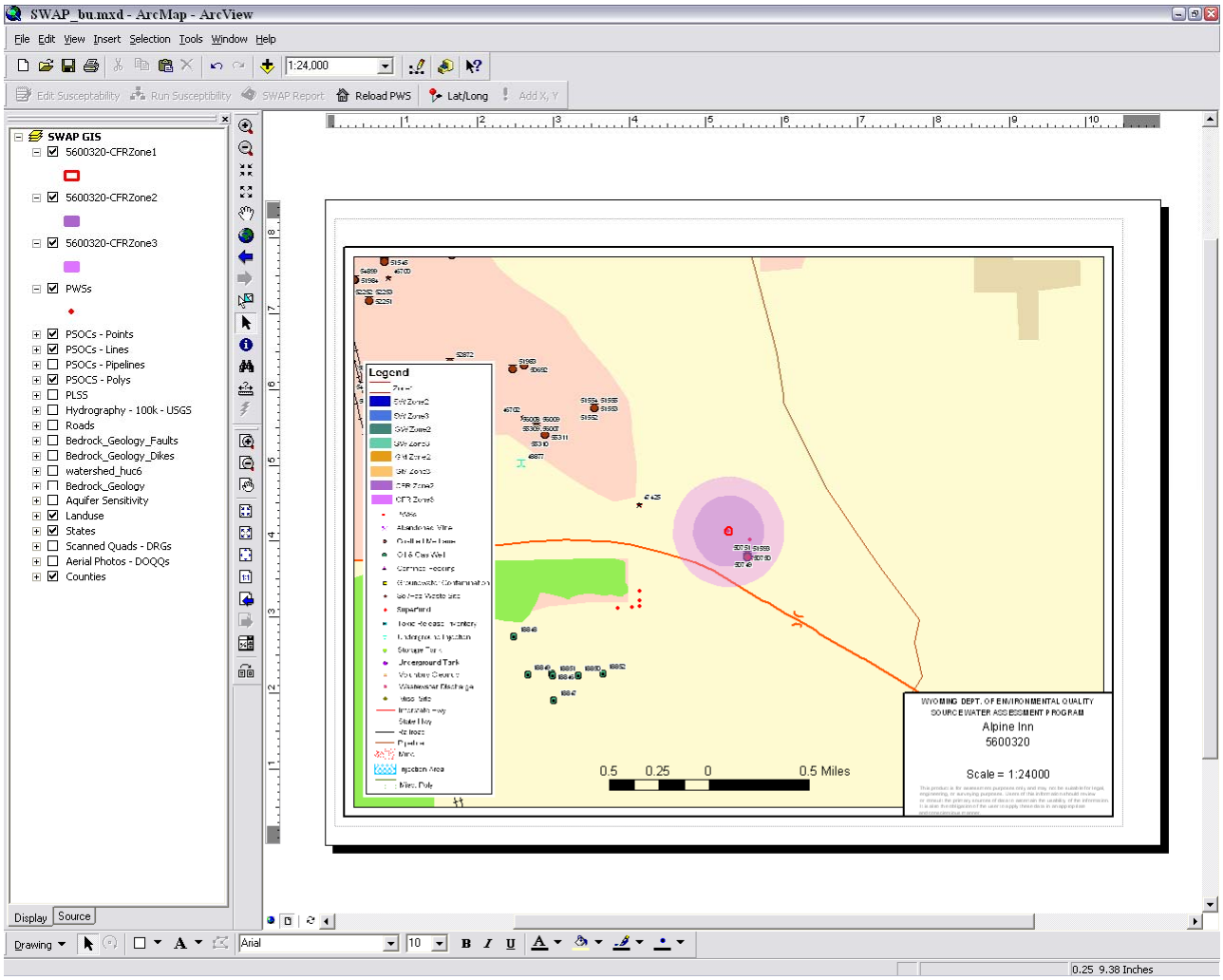
5. The **Printer Selection Form** dialog will show up. Please choose the appropriate printer and paper size. The paper size is listed on the form above the listboxes. *Only the printers available on the local computer are visible in the printer list box.



6. Click [**Continue]** after selecting the printer and paper size.

7. Under the File menu, choose [**Print]**. (The map can be adjusted if the basic layout is not ideal. Please refer to the ArcMap's online help option for more details.)

8. Below is an example of the map layout view with a formatted A sized (letter) map.



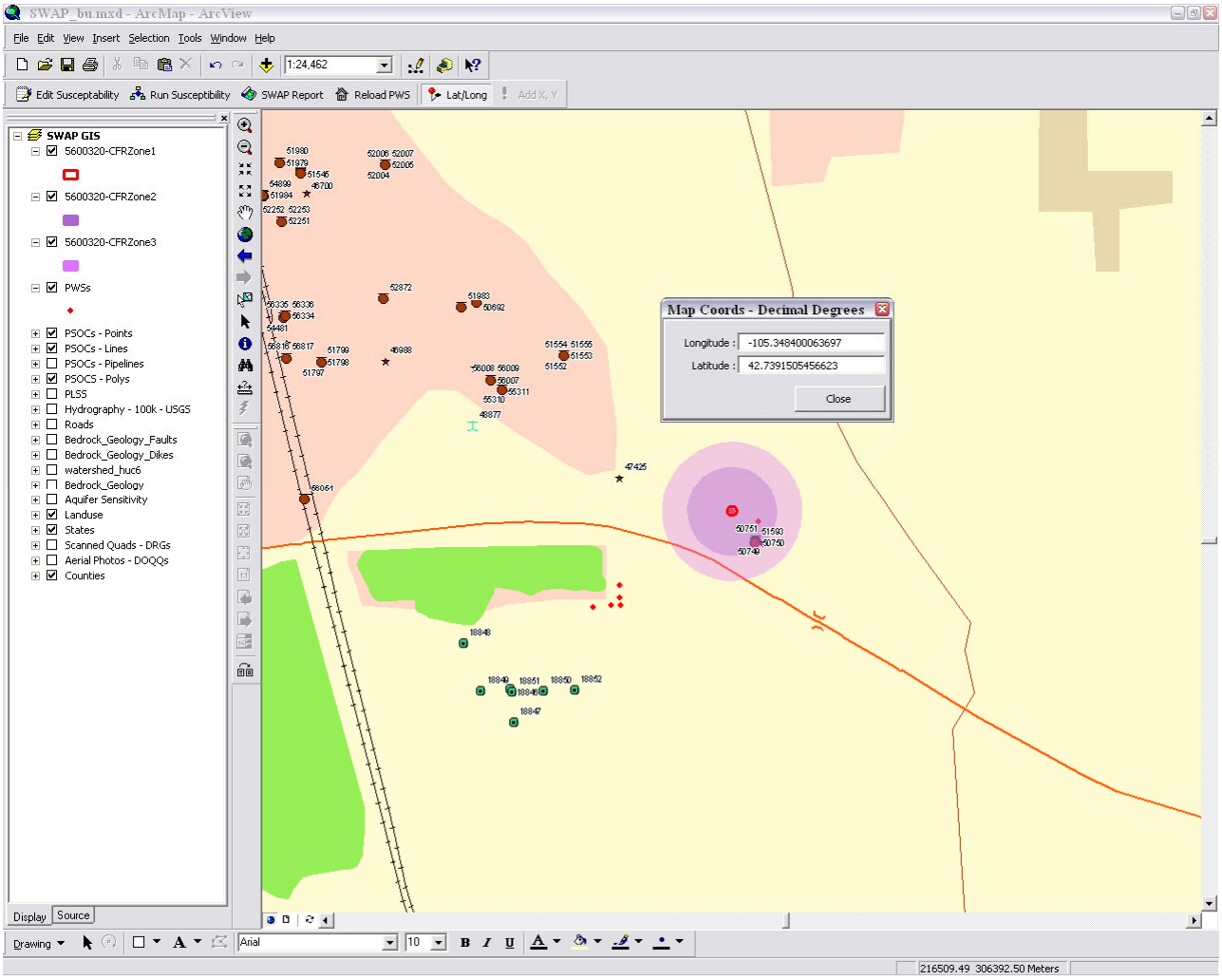
3.5 OTHER CUSTOM GIS TOOLS

3.5.1 RELOADING PWS POINTS

The [**Reload PWS]** button is used to recreate the PWS layer in the GIS interface. In the case where a well location has been updated in the database by changing the latitude and longitude values, this button will reload the latest coordinates and replace the PWS layer with the updated well locations. It reads the well/intake coordinates from the database and creates a new layer then loads it into the map. This button is primarily used to move well locations. To get the latitude and longitude coordinates for a location, the user can use the **[Lat/Long]** tool.

3.5.2 GETTING COORDINATES

If a well location needs to be moved, the coordinates need to be updated in the SWAP project database. To get the latitude and longitude coordinates from the map, use the [**Lat/Long**] button. After clicking on the [**Lat/Long**] button, click inside the map. The **Map Coords** dialog (shown below) will appear with the latitude and longitude coordinates of the point where clicked. The coordinates can then be copied and pasted from this dialog box.



3.5.3 ADDING X, Y COORDINATES TO AN ATTRIBUTE TABLE

The last button was rarely used within the application; however, it was developed for this project and can be a useful tool. This tool will add X, Y coordinates to any point or polygon layer's attribute table. It will add two fields and calculate the coordinates for each feature and write them in the new fields. This tool was used to get all of the well/intake coordinates and updating the database with the new locations for many wells.