# GIS SPATIAL DATA, TABULAR DATA, AND METADATA
## *ASSOCIATED WITH REPORT 374 AGGREGATE RESOURCES EVALUATION CARLTON COUNTY, MINNESOTA, AND THE FOND DU LAC RESERVATION JUNE 2009*

**Project of the Minnesota Department of Natural Resources (MN DNR),**
**Division of Lands and Minerals, Mineral Potential Evaluation Unit,**
**Aggregate Resource Mapping Program**
Website: http:\\www.dnr.state.mn.us\lands_minerals\aggregate_maps\index.html

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The spatial and tabular digital data being released for MN DNR Report 374 has been packaged into two types of common spatial data file formats from ESRI (Environmental Systems Research Institute); ESRI **Shapefile** and ESRI **File Geodatabase** (for more information see aboutgisdata.pdf). If your ESRI GIS software package is either ArcView 3.x, ArcGIS Desktop 8x, or ArcGIS 9.0/9.1/9.2 the shapefile format should be used. If you are using ArcGIS 9.3, or any later version of ArcGIS post this data release, you can use the File Geodatabase provided. Associated **metadata** has been provided as **html files**, viewable in any web browser, and as **xml files** for most of the shapefiles and feature classes. Note the xml files are best viewed in ArcCatalog (ArcGIS Desktop) by clicking the metadata tab. For better metadata viewing it is recommended to use the 'mgmg' stylesheet developed by LMIC (Land Management Information Center). To download the mgmg stylesheet for ArcGIS 9 visit: http://www.lmic.state.mn.us/chouse/arccatalog.html.

This document's goal is to list in detail the digital data released and its directory structure locations for both the shapefiles and file geodatabase.

## *Contents of the Data Folder*
### Title Folders:
'data\resource\shapefiles'
'data\resource\file_geodatabase'
*(The file geodatabase is only viewable in ArcGIS 9.3 and any future versions of ArcGIS Desktop)*

## SHAPEFILE FOLDERS - 'data\resource\shapefiles'
Digital data folders are organized by the government agency that developed or is most associated with the released datasets. Details of each folder can be found on the subsequent pages.

| Minnesota Department of Natural Resources | Minnesota Geological Survey | Minnesota Department of Transportation | Bureau of Indian Affairs |
|---|---|---|---|
| \mn_dnr | \mgs | \mn_dot | \bia |
| \mn_dnr\spatial | \mgs\spatial | \mn_dot\spatial | \bia\spatial |
| \mn_dnr\tabular | \mgs\tabular | \mn_dot\tabular | \bia\metadata |
| \mn_dnr\metadata | \mgs\metadata | \mn_dot\metadata | |

# FILE GEODATABASE FOLDER - 'data\resource\file_geodatabase'

*(Only viewable in ArcGIS 9.3 and any future versions of ArcGIS Desktop)*

## File Geodatabase

Name: *carlton_aggregate_data.gdb*

## Feature Datasets

Feature datasets are organized by the government agency that developed or is most associated with the released datasets. In each feature dataset are one or more feature classes. Details of each feature dataset's feature classes are identical to the folder subdirectories for the shapefiles seen above. Therefore that information can also be found on the subsequent pages.

\mn_dnr
\mgs
\mn_dot
\bia

## File Geodatabase Tabular Related Data

Unlike the shapefiles folder the related tables in the file geodatabase are attached to the file geodatabase rather than being placed within the government agency folder that they are related to. Below is a list of the three related tables and their government agency. For details see the following subsequent pages following the shapfiles folder directory structure in this document.

**\carlcwistrat0607 (mgs)**
**\carldotqual (mn_dot & mn_dnr)**
**\carlsieve (mn_dnr)**

## File Geodatabase Metadata

Metadata for the file geodatabase are embedded into the geodatabase and cannot be viewed in windows explorer. However, the xml files can be viewed using ArcCatalog (ArcGIS 9.3 only if using file geodatabase) under the Metadata tab.

# SUB-DIRECTORY FOLDER DETAILS

## MN DNR, Division of Lands and Minerals, Aggregate Resource Mapping Program's GIS Spatial and Tabular Data Developed or Modified for this Study

**{data\resource\shapefiles\mn_dnr}**
**{data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dnr}**

### MN DNR GIS Spatial Data

**Shapefiles {data\resource\shapefiles\mn_dnr\spatial}**
**File Geodatabase Feature Classes {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dnr}**

**carlsgp**: Polygon Features, Sand and Gravel Potential in Carlton County and the Fond du Lac Reservation. This dataset consists of information about the geology, geological characteristics, and sand and gravel potential of 256 map units. Five fields relate to the surficial geology of the map unit, including a unique map unit id, sediment, landform, surficial geology description, and dominant lithology. Five fields relate to sand and gravel characteristics, including probability, quality, texture, overburden thickness, deposit size, and sand and gravel thickness. These characteristics were used to calculate the aggregate potential of the map unit for sand and gravel.

**carlcsp**: Polygon Features, Crushed Stone Potential in Carlton County and the Fond du Lac Reservation. This dataset consists of information about the geology, geological characteristics, and aggregate potential of crushed stone potential units. Four attribute fields relate to the crushed stone characteristics, including overburden thickness, quality, probability, and bedrock geological unit. These characteristics were used to calculate the aggregate potential of the map unit for crushed stone.

**carlfobs***: Point Features, Field Observations in Carlton County and the Fond du Lac Reservation. This dataset includes information gathered in the field. Fieldwork was completed in the spring and fall of 2008. It includes 1212 field observation sites within Carlton County and the Fond du Lac Reservation. Observations include, but are not limited to: aggregate pits (gravel pits, sand pits), clay pits, and borrow pits; test holes; exposures of surficial geologic sediment, glacial stratigraphy, and bedrock formations in road cuts or along stream banks; excavations for basements, judicial ditches, construction projects, and trenches (cable, pipe, tiling). This spatial dataset contains a field description of each site, the dominant type of material encountered, the source of information, geologic unit thickness, and geologic overburden thickness. A selected number of observation's geologic sediment were sampled and analyzed with a sieve. A table was created based on the sieve analysis that can be joined to this dataset's unique observation id (see associated datasets)
*Shapefile has related database table titled 'carlsieve' found in the 'MN DNR GIS Tabular Data'

**carlpits**^: Point Features, Mining Pits in Carlton County and the Fond du Lac Reservation. This dataset consists of location information, source information, and geological characteristics for 424 mining pits (372 Gravel Pits, 33 Sand Pits, 16 Borrow Pits, and 3 Clay Pits) within Carlton County and Fond du Lac Reservation that are currently being mined or have been mined. Several sources of information identify pit locations: topographic maps, aerial photographs, soil surveys, Mn/DOT (Aggregate Source Information System) ASIS files, fieldwork, gravel operators, and other miscellaneous sources. Pits range in size from less than 1 acre to greater than 50 acres and may be active, inactive, or reclaimed. The aggregate quality of the pit varies.
^ Shapefile has related database table titled 'carldotqual'found in both the 'MN/DOT GIS Tabular Data' and 'MN DNR GIS Tabular Data'

**carlrp**: Point Features, Rock Piles in Carlton County and the Fond du Lac Reservation. This dataset includes field observations of rock piles. Rock piles can be a source for crushed stone or rip rap. Fieldwork was completed in the spring and fall of 2008. It includes approximately 262 field observation sites of rock piles within Carlton County and the Fond du Lac Reservation.

**carldep**: Polygon Features, Depleted Mining Lands in Carlton County and the Fond du Lac Reservation. This dataset includes polygon information gathered from aerial photographs and verbal communication on areas showing indication(s) that sand and gravel resources are significantly depleted. For Carlton County and Fond du Lac Reservation delineated areas are 20 acres or larger. Indicators include reclamation of mine lands, secondary use of mine lands, and/or reclaimed extent of mine lands bounded by other land uses. Additional resources may exist at depth. Areas labeled as depleted are limited to mine lands where aggregate resources have been partially or entirely extracted and do not include development (i.e. residential or commercial) over resources that have not been mined. Information gathering was completed in the spring of 2008 through the spring of 2009. It includes 9 polygons within Carlton County and the Fond du Lac Reservation.

**carlctybdry**: Polygon Features, Boundary of Carlton County. This dataset is an extraction from 'Minnesota County Boundaries' spatial dataset that originated from the Minnesota DNR. It is derived from a combination of 1:24,000 scale PLS lines. 1:100,000 scale TIGER, 1:100,000 scale DLG, and 1:24,000 scale hydrography lines. At the time of its development (1993), the largest available scale data were assembled to create the layer.

**carlprjbdry**: Polygon Features, Project Boundary for MN DNR Aggregate Resource Evaluation of Carlton County and the Fond du Lac Reservation. This dataset is a combination of the Fond Du Lac Indian Reservation boundary from the Bureau of Indian Affairs source date 1993 and the Boundary of Carlton County, Minnesota source date 1993. It was created to provide a project boundary for the MN DNR Report 374, Aggregate Resource Evaluation of Carlton County and Fond du Lac Reservation published June 2009.

## MN DNR GIS Tabular Data

**DBFs {data\resource\shapefiles\mn_dnr\tabular}**
**File Geodatabase Tables {data\resource\file_geodatabase\carlton_aggregate_data.gdb\}**

**Carlsieve.dbf**: Database, Carlton County and the Fond du Lac Reservation Sieve Analysis Table, 2009.

**Carldotqual.dbf**: Database, MN/DOT ASIS Quality Table Created by MN DNR, 2008, Carlton County and the Fond du Lac Reservation. This dataset consists of information about the quality of Minnesota Department of Transportation's evaluated gravel pits and other aggregate sources. Quality information includes soundness, durability, and mineral content. This table contains the averages and ranges of values for the different quality tests and was summarized by the MN DNR from the Mn/DOT pit sheets.

## MN DNR GIS Associated Metadata

**HTML {data\resource\shapefiles\mn_dnr\metadata}**
**XML {data\resource\shapefiles\mn_dnr\spatial}**
**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dnr}**

*The associated metadata in html and xml format, where "_att" indicates the fields and attributes in the spatial database*

**HTML {data\resource\mn_dnr\metadata}**

carlsgp.html (carlsgp_att.html)
carlcsp.html (carlcsp_att.html)
carlfobs.html (carlfobs_att.html)
carlpits.html (carlpits_att.html)
carlrp.html (carlrp_att.html)
carldep.html (carldep_att.html)
carlctybdry.html
carlprjbdry.html
carldotqual.html (carldotqual_att.html)

**XML {data\resource\shapefiles\mn_dnr\spatial}**

carlsgp.shp.xml (carlsgp_att.html)
carlcsp.shp.xml (carlcsp_att.html)
carlfobs.shp.xml (carlfobs_att.html)
carlpits.shp.xml (carlpits_att.html)
carlrp.shp.xml (carlrp_att.html)
carldep.shp.xml (carldep_att.html)

carlctybdry.shp.xml
carlprjbdry.shp.xml

**XML {data\resource\shapefiles\mn_dnr\tabular}**

carldotqual.dbf.xml (carldotqual_att.html)

**XML {data\resource\mn_dnr\file_geodatabase\ carlton_aggregate_data.gdb\mn_dnr}**

*Metadata for the file geodatabase mn_dnr feature classes are embedded into the data and could not be viewed in windows explorer. This xml file can only be viewed using ArcCatalog (ArcGIS 9.3 only if using file geodatabase) under the Metadata tab.*

## Minnesota Geological Survey (MGS) Data Used in this Study

**{data\resource\shapefiles\mgs}**
**{data\resource\file_geodatabase\carlton_aggregate_data.gdb\mgs}**

### MGS GIS Spatial Data

**Shapefile {data\resource\shapefiles\mgs\spatial}**
**File Geodatabase Feature Class {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mgs}**

**carlcwiwells0607****: Point Features, CWI Well Locations, 2007, in Carlton County and the Fond du Lac Reservation. This dataset consists of the locations of wells drilled within Carlton County and the Fond du Lac Reservation. The County Well Index (CWI) is a database that contains geologic information about wells drilled throughout Minnesota. Locations were used to look at the geological descriptions of these wells. This CWI dataset was downloaded from the Minnesota Geological Survey (MGS) in June of 2007 and contained 3429 wells within the project's spatial extent. The original CWI file was downloaded from the Minnesota Geological Survey (MGS) in June of 2007. CWI is web accessible at: http:\\www.health.state.mn.us\divs\eh\cwi\. This shapefile contains a field (doh_path) that can be hyper linked to the above mentioned web page based on the well's relateid. Hyper linking can be utilized when using ESRI software, ArcView 3.x or ArcGIS 9.x. Some wells do not display due to either, security reasons, or they have yet to be implemented into the system.
** Shapefile has related database table 'carlcwistrat0607' found in 'MGS GIS Tabular Data'

### MGS GIS Tabular Data

**DBF {data\resource\shapfiles\mgs\tabular}**
**File Geodatabase Table {data\resource\file_geodatabase\carlton_aggregate_data.gdb\}**

**Carlcwistrat0607:** Database, CWI Well Stratigraphy Table, June 2007, Carlton County and the Fond du Lac Reservation. This is the database of geological descriptions used for this project. This database was extracted from the c4st table in cwidata.mdb and contains the stratigraphy for 3316 wells from carlcwiwells.shp. The stratigraphy table (carlcwistrat0607.dbf) can be linked (ArcView 3.x) or related (ArcGIS 9.x) to carlcwiwells0607.shp on the field 'relateid'.

### MGS GIS Associated Metadata

**HTML {data\resource\shapefiles\mgs\metadata}**
**XML {data\resource\shapefiles\mgs\spatial}**
**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mgs}**

*The associated metadata in html and xml format, where "_att" indicates the fields and attributes in the spatial database*

**HTML {data\resource\shapefiles\mgs\metadata}**

Carlcwiwells0607.html (carlcwiwells0607_att.htm)
Carlcwistrat0607.html (carlcwiwells0607_att.htm)

**XML {data\resource\shapefiles\mgs\spatial}**

Carlcwiwells0607.shp.xml (carlcwiwells0607_att.htm)

**XML {data\resource\shapefiles\mgs\tabular}**

Carlcwistrat0607.dbf.xml (carlcwiwells0607_att.htm)
*Includes stratigraphy field and attribute information.*

**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mgs}**

*Metadata for the file geodatabase mgs feature class and mgs shapefile are embedded into the data. This information is best viewed using ArcCatalog (ArcGIS 9.3 only if using file geodatabase) under the Metadata tab.*

## Minnesota Department of Transportation (Mn/DOT) Data Used in this Study

**{data\resource\shapefiles\mn_dot}**
**{data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dot}**

### Mn/DOT GIS Spatial Data

**Shapefile {data\resource\shapefiles\mn_dot\spatial}**
**File Geodatabase Feature Class {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dot}**

**carlasis0108**: Point features, Mn/DOT Aggregate Source Information System (ASIS) spatial data downloaded in January of 2008. This is the original shapefile that was reviewed and edited in the field for purpose of completing the Mining Pit inventory for Carlton County and the Fond du Lac Reservation. The updated data based on field work and pit sheet review can be found in the carlpits shapefile under field 'source' attribute 'ASIS'. See carldotqual.dbf below for more details.

### Mn/DOT GIS Tabular Data

**DBF {data\resource\shapefiles\mn_dot\tabular}**
**File Geodatabase Table {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dot}**

**carldotqual.dbf**: Database, MN/DOT ASIS Quality Table Created by MN DNR, 2008, Carlton County and the Fond du Lac Reservation. This dataset consists of information about the quality of Minnesota Department of Transportation's evaluated gravel pits and other aggregate sources. Quality information includes soundness, durability, and mineral content. This table contains the averages and ranges of values for the different quality tests and was summarized by the MN DNR from the Mn/DOT pit sheets.

### Mn/DOT GIS Associated Metadata

**HTML and PDF {data\resource\shapefiles\mn_dot\metadata}**
**XML {data\resource\shapefiles\mn_dot\spatial}**
**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dot}**

*The associated metadata in html, pdf, and xml format, where "_att" indicates the fields and attributes in the spatial database*

**HTML and PDF {data\resource\shapefiles\mn_dot\metadata}**

**Carldotqual.html (carldotqual_att.html)**
**Carlasis0108.html**
**oasismeta08.pdf (Metadata in PDF format for attribute fields in carlasis0108.shp)**

**XML {data\resource\shapefiles\mn_dot\spatial}**

**Carlasis0108.shp.xml (see oasismeta08.pdf for attributes)**

**XML {data\resource\shapefiles\mn_dot\tabular}**

**Carldotqual.dbf.xml (carldotqual_att.html)**

**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\mn_dot}**

*Metadata for the file geodatabase carldotqual tabular data and carlasis0108 are embedded into the file geodatabase. This information is best viewed using ArcCatalog (ArcGIS 9.3 only if using file geodatabase) under the Metadata tab.*

## Bureau of Indian Affairs (BIA) Data Used in this Study

**{data\resource\shapefiles\bia}**
**{data\resource\file_geodatabase\carlton_aggregate_data.gdb\bia}**

### BIA GIS Spatial Data

**Shapefiles {data\resource\shapefiles\bia\spatial}**
**File Geodatabase Feature Classes {data\resource\file_geodatabase\carlton_aggregate_data.gdb\bia}**

**fondbdry:** Polygon features, Fond du Lac Reservation Boundary, 2003. This dataset shows the Fond du Lac Reservation Boundary extracted from Minnesota Native American reservations in the State of Minnesota. This dataset was provided by the BIA.
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### BIA GIS Associated Metadata

**HTML {data\resource\shapefiles\bia\metadata}**
**XML {data\resource\shapefiles\bia\spatial}**

**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\bia**

*The associated metadata in html and xml format.*

**HTML {data\resource\shapefiles\bia\metadata**
fondbdry.htm

**XML {data\resource\shapefiles\bia\spatial}**
fondbdry.shp.xml

**XML {data\resource\file_geodatabase\carlton_aggregate_data.gdb\bia}**

*Metadata for the file geodatabase fondbdry are embedded into the file geodatabase. This information is best viewed using ArcCatalog (ArcGIS 9.3 only if using file geodatabase) under the Metadata tab.*