

**Aitkin County, Minnesota - Aggregate Resources**  
Aggregate Pits and Prospects  
*Gravel Pits, Sand Pits, Borrow Pits, and Prospects*  
**aitk\_pits**

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**Metadata Summary**

<b>Originator</b>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section
<b>Abstract</b>	This dataset consists of location information, source information, and geological characteristics for 464 aggregate pits (334 Gravel Pits, 50 Sand Pits, 11 Borrow Pits, and 69 gravel prospects) in Aitkin County, MN. There are pits 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.
<b>Browse Graphic</b>	none available
<b>Time Period of Content Date</b>	2013
<b>Currentness Reference</b>	Source information in the pit shapefile was collected from the following: field work, soil survey, topographic maps, aerial 7.5 minute topographic quadrangles, and ASIS (Aggregate Source Information System). Pits were identified during field work by Steve Kostka in the fall of 2008, 2009, and 2010. Additional identification was completed in summer of 2013 by Carrie Jennings. Pit locations were digitized and edited in ArcGIS Desktop either in real time while in the field or in the office on U.S. Geological Survey, 7.5 minute topographic quadrangles at a scale of 1:24000. The age of the quadrangles range from 1967 to 1983, with some quads photo revised in 1994. The aggregate pits located from the Soil Survey are from 2007. Pits from aerial photographs are identified from NAPP (National Aerial Photography Program), 1991-1992, 9 inch by 9 inch color infrared photographs at 1:40,000, Farm Service Agency (FSA) air photos from 2003-04, 2005, 2006, 2008, 2009, and 2010. ASIS data points were acquired from the Minnesota Department of Transportation in January of 2008.
<b>Access Constraints</b>	
<b>Use Constraints</b>	Acknowledgement of the Minnesota Department of Natural Resources is appreciated for products derived from these data.
<b>Distributor Organization</b>	Minnesota Department of Natural Resources, Division of Lands and Minerals
<b>Ordering Instructions</b>	Aitkin County's aggregate resource spatial datasets (shapefiles & file geodatabase) are included in the file Aitkindata.zip, accessible from the MN DNR Aggregate Mapping web page: <a href="http://www.dnr.state.mn.us/lands_minerals/aggregate_maps/completed/index.html">http://www.dnr.state.mn.us/lands_minerals/aggregate_maps/completed/index.html</a> The spatial datasets include: sand and gravel resource potential, test-holes drilled, geologic field observations, aggregate pits, Minnesota Geological Survey (MGS) County Well Index (CWI) data points, Mn/DOT Aggregate Source Information System (ASIS) points, and Mn/DOT ASIS pit quality table.
<b>Online Linkage</b>	<a href="#">Click here</a> to download data. (See Ordering Instructions above for details.) By clicking here, you agree to the notice in "Distribution Liability" in Section 6 of this metadata.

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## Full Metadata

# Aitkin County Aggregate Resources: aitk\_pits (aggregate pits)

Section 1	Identification Information		
<b>Originator</b>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section		
<b>Title</b>	Aitkin County Aggregate Resources: aitk_pits (aggregate pits)		
<b>Abstract</b>	This dataset consists of location information, source information, and geological characteristics for 334 aggregate pits (334 Gravel Pits, 50 Sand Pits, 11 Borrow Pits, and 69 gravel prospects) in Aitkin County, MN. There are pits 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.		
<b>Purpose</b>	To display the current and historic mining pit (gravel, sand, and borrow) locations within Aitkin County, Minnesota.		
<b>Time Period of Content Date</b>	2013		
<b>Currentness Reference</b>	Data were collected between 2008 and 2013.		
<b>Progress</b>	Complete		
<b>Maintenance and Update Frequency</b>	None planned		
<b>Spatial Extent of Data</b>	Aitkin County, Minnesota		
<b>Bounding Coordinates</b>	-93.81 -93.05 47.16 46.15		
<b>Place Keywords</b>	Aitkin County, Minnesota		
<b>Theme Keywords</b>	Gravel pit, Sand pit, Aggregate Source Information System (ASIS)		
<b>Theme Keyword Thesaurus</b>			
<b>Access Constraints</b>			
<b>Use Constraints</b>	Acknowledgement of the Minnesota Department of Natural Resources is appreciated for products derived from these data.		
<b>Contact Person Information</b>	Aggregate Resource Mapping Program, Industrial Minerals Geologist or GIS Specialist Minnesota Department of Natural Resources, Division of Lands and Minerals 500 Lafayette Road St. Paul, MN 55155-4045 Phone: 651-259-5959 FAX: 651-296-5939 E-mail: <a href="mailto:kevin.hanson@state.mn.us">kevin.hanson@state.mn.us</a>		
<b>Browse Graphic</b>	none available		

**Browse Graphic  
File Description**

**Associated Data  
Sets**

Aitkin County's aggregate resource spatial datasets (shapefiles & file geodatabase) are included in the file Aitkindata.zip, accessible from the MN DNR Aggregate Mapping web page:

[http://www.dnr.state.mn.us/lands\\_minerals/aggregate\\_maps/completed/index.html](http://www.dnr.state.mn.us/lands_minerals/aggregate_maps/completed/index.html)

The spatial datasets include: sand and gravel resource potential, test-holes drilled, geologic field observations, aggregate pits, Minnesota Geological Survey (MGS) County Well Index (CWI) data points, Mn/DOT Aggregate Source Information System (ASIS) points, and Mn/DOT ASIS pit quality table.

**Section 2**

**Data Quality Information**

**Attribute Accuracy**

**Logical Consistency**

**Completeness**

Described in the lineage section.

**Horizontal  
Positional Accuracy**

These points were captured from several different sources, including USGS 1:24000 quadrangles, 1:12000 USGS DOQs (from 1991), Farm Service Agency (FSA) color air photos (from 2003-04, 2005, 2006, 2008, 2009, and 2010), Natural Resource Conservation Service Soil Survey point data, and the ASIS (Aggregate Source Information System) dataset from the Minnesota Department of Transportation. Points captured in the field were assisted with a GPS (+/- 3 Meters), Tablet PC, and ArcGIS versions 9.3, 10.0, and 10.1.

**Vertical Positional  
Accuracy**

Not applicable.

**Lineage**

These points were captured from several different digital GIS data sources in the fall of 2008, including USGS 1:24000 quadrangles, 1:12000 USGS DOQs (from 1991), Farm Service Agency (FSA) color air photos (from 2003-04, 2005, 2006, 2008), Natural Resource Conservation Service Soil Survey point data, and the ASIS (Aggregate Source Information System) dataset from the Minnesota Department of Transportation. The pits captured were edited in the field during the Fall of 2008, 2009, 2010, and Spring of 2013 with a GPS (+/- 3 Meters), tablet PC, and ArcGIS 9.3. The gravel pits that are medium (5-15 Acres) to large (15+ Acres) are located somewhere in the disturbed area, and should be very accurate.

**Source Scale  
Denominator**

24000

**Section 3**

**Spatial Data Organization  
Information**

**Native Data Set  
Environment**

ArcGIS Desktop versions: 9.3, 10.0, 10.1

**Geographic  
Reference for  
Tabular Data**

**Spatial Object Type**

Point

**Vendor Specific  
Object Types**

Point

**Tiling Scheme**

None

<b>Section 4</b>	<b>Spatial Reference Information</b>		
<i>Horizontal Coordinate Scheme</i>	UTM		
<i>Ellipsoid</i>	GRS80		
<i>Horizontal Datum</i>	NAD83		
<i>Horizontal Units</i>	Meters		
<i>Distance Resolution</i>			
<i>Altitude Datum</i>	Not applicable		
<i>Depth Datum</i>	Not applicable		
<i>UTM Zone Number</i>	15E north		

<b>Section 5</b>	<b>Entity and Attribute Information</b>		
<i>Entity and Attribute Overview</i>	This dataset consists of pit information such as; location, type, source, relative size, material thickness and overburden, depth to water table, dominant texture, lithology, and geologist comments.		
<i>Entity and Attribute Detailed Citation</i>	See beyond Section 7 for detailed field and attribute information		

<b>Section 6</b>	<b>Distribution Information</b>		
<i>Publisher</i>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section		
<i>Publication Date</i>	2014		
<i>Contact Person Information</i>	Aggregate Resource Mapping Program Industrial Minerals Geologist or GIS Specialist Minnesota Department of Natural Resources, Division of Lands and Minerals 500 Lafayette Road St. Paul, MN 55155-4045 Phone: 651-259-5959 FAX: 651-296-5939 E-mail: <a href="mailto:kevin.hanson@state.mn.us">kevin.hanson@state.mn.us</a>		
<i>Distributor's Data Set Identifier</i>	Aitkin County Aggregate Resources, Sand and Gravel Potential		
<i>Distribution Liability</i>	The State of Minnesota makes no representations or warranties express or implied, with respect to the use of the information contained herein regardless of its format or the means of its transmission. There is no guarantee or representation to the user as to the accuracy, currency, suitability, completeness, usefulness, or reliability of this information for any purpose. The user accepts the information "as is." The State of Minnesota assumes no responsibility for loss or damage incurred as a result of any user's reliance on this information. All maps, reports, data, and other information contained herein are protected by copyright. Permission is granted to copy and use the materials herein for any lawful noncommercial purpose. Any user of this information agrees not to transmit or provide access to all or any part of this information to another party unless the user shall include with the information a copy of this disclaimer.		
<i>Transfer Format</i>			

*Name*

*Transfer Format*

*Version Number*

*Transfer Size*

mb for data, mb for associated maps

*Ordering  
Instructions*

Aitkin County's aggregate resource spatial datasets (shapefiles & file geodatabase) are included in the file Aitkindata.zip, accessible from the MN DNR Aggregate Mapping web page:

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*Online Linkage*

[Click here](#) to download data. (See Ordering Instructions above for details.) By clicking here, you agree to the notice in "Distribution Liability" above.

## Section 7

## Metadata Reference Information

*Metadata Date*

2014

*Contact Person  
Information*

Aggregate Resource Mapping Program, Industrial Minerals Geologist or GIS Specialist  
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500 Lafayette Road  
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*Metadata Standard  
Name*

Minnesota Geographic Metadata Guidelines

*Metadata Standard  
Version*

2.1

*Metadata Standard  
Online Linkage*

<http://www.lmic.state.mn.us/gc/stds/metadata.htm>

Table Name	Field Name	Definition	Valid Values	Descriptions
aitk_pits.dbf				
	PIT_Q_ID	Number, 9,0	Ex: 1,2,3,4,5,6,7.... 341, 342, 343, 344	Aggregate pit unique ID
	Source	Text, 30	See Below	Construction aggregate pit data source compiled from or observed (ex: topographic map- found on the topographic map). Where multiple records existed for a single gravel pit, data points were removed based on a constructed hierarchy of source information. The following sources of information are listed according to rank.
			MNDOT ASIS	Minnesota Department of Transportation database called Aggregate Source Information Systems. If the location did intersect a gravel pit, the locations were interpreted off of existing gravel pit sheets to relocate the mines to as specified on the sheet. This was ranked highest because of associated quality and texture data. Some locations were modified to better correlate to present gravel pit boundaries and on top of USGS 7.5 Minute Topographic Map symbols.
			Topographic Map	These gravel pits are located from USGS 7.5 minute quadrangles. This was ranked second highest because of the widespread use of the maps. Where field checked, some of these pit types were changed from gravel to borrow or sand pits to reflect the material excavated.
			Field Work	These pits were located while in the field. These pits were ranked third highest due to the fact they were directly observed for quality, texture, and spatial accuracy.
			Soil Survey	The records for these pits are from the Soil Survey Geographic Database (SSURGO) Aitkin County. The dataset was downloaded in June 2010. These pits were ranked fourth highest.
			Air Photo	Gravel mines were also located and some attributes were interpreted with air photography. These pits were ranked last because they were remotely interpreted.
	Type	Text, 30	See Below	The type of pit observed
			Gravel Pit	Gravel Pit
			Sand Pit	Sand Pit
			Borrow Pit	Borrow Pit- is defined not by use but by material. If a pit contains significant clay and silt material, it was classified as borrow.
	Asis_numbr	Text, 8, 0	Ex: 09002, 09019,, 09115,	Aggregate Source Information System Number (MN/DOT Database). An empty field means that it does not have an ASIS number. Use this field to join with aitk_asisquality.dbf for the pits that list

				the Source as "ASIS"
	Size	Text, 8	See Below	Refers to the relative size of the pit.
			Small	Small pits are less than five acres. These pits are usually used by private landowners or for small jobs.
			Medium	Between 5 and 15 acres in size. These pits are used by landowners and for small construction jobs. They are generally used for short periods of time by contractors.
			Large	These pits are generally greater than 15 acres and are typically used by commercial aggregate operators.
	Thickness	Text, 15	Ex: +10, ~20, +25, 10, 25, Not Available	The thickness of the deposit expressed in combination with a modifier. Not Available indicates that the measurement does not apply or was not observed.
	Thick_mod	Text, 1	Ex: +,-	Modifiers to express numeric approximations observed for deposit thickness: + greater than - to, as in 10-20
	Thick_min	Number, 4	Ex: 5, 10, 15...-999	Gives the minimum value for thickness. (-999 is a null value)
	Thick_max	Number, 4	Ex: 5, 10, 15...-999	Gives the maximum value for thickness. (-999 is a null value)
	Overburden	Text, 15	Ex: +10, ~20, +25, 10, 25, Not Available	Expresses overburden thickness in the pit by using a value in combination with a modifier if appropriate. Not Available indicates that the measurement does not apply or was not observed.
	Ob_mod	Text, 1	Ex: ~, -, +	Modifiers to express numeric approximations for the overburden thickness at a gravel pit. ~ approximate - to, as in 10-20 + greater than
	Ob_min	Number, 4	Ex: 5, 10, 15...-999	Gives the minimum value for overburden thickness. (-999 is a null value).
	Ob_max	Number, 4	Ex: 5, 10, 15...-999	Gives the maximum value for overburden thickness. (-999 is a null value).
	Watertable	Text, 15	Ex: +10, ~20, +25, 10, 25, Not Available	The depth of the water table expressed in combination with a modifier. Not Available indicates that the measurement does not apply or was not observed.
	Wattabmod	Text, 1	Ex: ~, -, +	Modifiers to express numeric approximations for the depth to the water table: ~ approximate - to, as in 10-20 + greater than

	Wattabmin	Number, 4	Ex: 5, 10. 15...-999	Describes the minimum depth to the water table within a pit or quarry. If 20 feet of gravel was exposed and there was no water table encountered, then +20 were used.  (-999 is a null value)
	Wattabmax	Number, 4	Ex: 5, 10. 15...-999	Describes the maximum depth to the water table within a pit or quarry. If 20 feet of gravel was exposed and there was no water table encountered, then +20 were used.  (-999 is a null value)
	Status_1	Text, 20	See Below	Refers to the status of the pit at the time of mapping.
			Active	Active indicates that the pit is either being actively mined or used for other mining related usage like stockpiling material.
			Inactive	Refers to a pit that was not immediately active when documented or may appear to have been inactive for some time.
			Reclaimed	The pit has been passively or actively reclaimed. Status_2 further describes the type of reclamation.
			Partially Reclaimed	Part of the pit has been passively or actively reclaimed. Status_2 further describes the type of reclamation.
	Status_2	Text, 50	See Below	Associated with the field Status_1. This field further explains the condition of a partially or fully reclaimed gravel pit. The status could be a combination of more than one use.
			Active	Specifies that mine is an active aggregate producing mine.
			Agriculture	Mine has been reclaimed into an agricultural use.
			Commercial	Mine has been reclaimed into an commercial development like a strip mall, a store, etc.
			Inactive	Mine is not presently active at time of assessment.
			Naturally Vegetated	Mine has been passively or naturally revegetated over time.
			Naturally Vegetated - Grass	Mine has been revegetated with grass.
			Naturally Vegetated - Trees	Mine has been revegetated with trees.
			Partially Vegetated	Mine has been partially revegetated and is partially unreclaimed.
			Partially Vegetated - Grass	Mine has been partially revegetated with grass and is partially unreclaimed.
			Pond	Mining was likely below the water table and created a pond.

			Recreation area	Mine has been reclaimed into a public recreation area.
			Residential	Mine has been reclaimed into residential development.
			Sloped and Vegetated	Mine has been purposely reclaimed, walls of mine have been sloped and the mine has been vegetated
			Vegetated	Mine has been reclaimed by vegetation
			Vegetated-Trees	Mine has been reclaimed and revegetated with trees
	Dom_litho	Text, 30	See Below	Dominant lithology of the pit.
			Superior lobe	Superior lobe had a northeasterly source. The quality of these deposits tends to be high to very high due to the rock types found within the deposits (basalt, granite, rhyolite) but some deleterious material may be present (e.g. schist).
			St. Louis sublobe	The St. Louis sublobe has a northwesterly source. It commonly has less desirable material including shale, carbonate.
			Rainy lobe	The Rainy lobe has a northerly source. The quality of these deposits is high to very high but some deleterious material may be present (e.g. schist).
	Dom_text	Text, 35	See Below	The dominant texture of the pit.
			Dimension Stone	Competent bedrock quarried for a wide variety of uses for building applications, examples include: tiles countertops, and facades.
			Could not observe	The texture of the pit was undetermined due to lack of access or exposure. In some cases proximal geologic evidence was used to make a textural determination.
			Sand	Indicates the deposit is composed of sand and has a fine texture.
			Sand and Gravel	Indicates the deposit has approximately equal or slightly more sand than gravel by percent weight.
			Sand with Gravel	Indicates the deposit overall has more sand than gravel by percent weight and has an overall fine texture.
			Sand minor Gravel	Indicates the deposit is predominately sand with a minor percentage of gravel or coarse material.
			Till	Heterogeneous deposit possibly consisting of any combination of clay, silt, sand, gravel, cobbles, and boulders deposited directly by a glacier. Granular material (fine sand to boulders) is typically suspended within a variable matrix (silty clay to sand). Till can be loose or compacted. Till is synonymous with the archaic term "drift," and is by and typically beneath a glacier.
	Comments	Text, 200	Ex: Very sandy deposit with limited	Geologist comments related to the pit.

			gravel	
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