

**Kanabec County, Minnesota - Aggregate Resources**  
Geologic Field Observations  
**kana\_fobs**

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**Metadata Summary**

<b><i>Originator</i></b>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section
<b><i>Abstract</i></b>	This dataset includes information gathered in the field. Fieldwork was completed in the fall of 2010 and spring of 2011. It includes 291 field observation sites within Kanabec County, Minnesota. Observations include, but are not limited to: gravel pits, exposures of surficial geologic sediment, and glacial stratigraphy in road cuts or along stream banks, excavations for construction projects and trenches (cable, pipe, and 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.
<b><i>Browse Graphic</i></b>	none available
<b><i>Time Period of Content Date</i></b>	2011
<b><i>Currentness Reference</i></b>	Data were collected in the fall of 2010 and spring of 2011
<b><i>Access Constraints</i></b>	
<b><i>Use Constraints</i></b>	Acknowledgement of the Minnesota Department of Natural Resources is appreciated for products derived from these data.
<b><i>Distributor Organization</i></b>	Minnesota Department of Natural Resources, Division of Lands and Minerals
<b><i>Ordering Instructions</i></b>	<p>Kanabec County's aggregate resource spatial datasets (shapefiles &amp; file geodatabase) are included in the file kanabecdata.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></p> <p>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.</p>
<b><i>Online Linkage</i></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

# Kanabec County Aggregate Resources: kana\_fobs (Geologic Field Observations)

Section 1	Identification Information		
<b>Originator</b>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section		
<b>Title</b>	Kanabec County Aggregate Resources: kana_fobs (Geologic Field Observations)		
<b>Abstract</b>	This dataset includes information gathered in the field. Fieldwork was completed in the fall of 2010 and spring of 2011. It includes 291 field observation sites within Kanabec County, Minnesota. Observations include, but are not limited to: gravel pits, exposures of surficial geologic sediment, and glacial stratigraphy in road cuts or along stream banks, excavations for construction projects and trenches (cable, pipe, and 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.		
<b>Purpose</b>	To summarize the field observations collected in Kanabec County, Minnesota. These field observations were made to confirm air photo interpretation that identified potential aggregate bearing landforms.		
<b>Time Period of Content Date</b>	2011		
<b>Currentness Reference</b>	Data were collected in the fall of 2010 and spring of 2011		
<b>Progress</b>	Complete		
<b>Maintenance and Update Frequency</b>	None planned		
<b>Spatial Extent of Data</b>	Kanabec County, Minnesota		
<b>Bounding Coordinates</b>	-93.52 -93.05 46.16 45.72		
<b>Place Keywords</b>	Kanabec County, Minnesota		
<b>Theme Keywords</b>	Field observations, aggregate resources, surficial geology.		
<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: [aggregatemap@state.mn.us](mailto:aggregatemap@state.mn.us)

***Browse Graphic***

none available

***Browse Graphic  
File Description***

***Associated Data  
Sets***

Kanabec County's aggregate resource spatial datasets (shapefiles & file geodatabase) are included in the file kanabecdata.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***

The data points were gathered at the location where field observations took place. Additional information is given in the Lineage section.

***Horizontal  
Positional Accuracy***

The differential correction of the GPS unit for GPS located sites is +/- 2 meters.

***Vertical Positional  
Accuracy***

Not applicable.

***Lineage***

A tablet PC, a GPS unit (Garmin Etrex), ArcGIS 9.3 software, and the GPS toolbar in ArcGIS 9.3 were used in the field to determine the track and location of the observer collecting the points. Field observation points were digitized in real time, as well as, the entered tabular attribute information. The combination of the GPS unit's location, USGS topographic maps (1:24,000), and aerial photographs (1:3,000 - 1:12,000) were used to assist in determining the observation's site location on screen. The GPS unit (with differential correction) is accurate to approximately a few meters.

***Source Scale  
Denominator***

3000

**Section 3**

**Spatial Data Organization  
Information**

***Native Data Set  
Environment***

ArcGIS 9.3

***Geographic  
Reference for  
Tabular Data***

***Spatial Object Type***

Point

***Vendor Specific  
Object Types***

Point

***Tiling Scheme***

None

Section 4	Spatial Reference Information		
<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		

Section 5	Entity and Attribute Information		
<i>Entity and Attribute Overview</i>	This dataset consists of field observation unique id, type of site, type of geologic material, description of the observation, unit thickness, overburden thickness, sampled (Y/N), and gravel percentage of material if sampled.		
<i>Entity and Attribute Detailed Citation</i>	See beyond Section 7 for detailed field and attribute information		

Section 6	Distribution Information		
<i>Publisher</i>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section		
<i>Publication Date</i>	2012		
<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:aggregatemap@state.mn.us">aggregatemap@state.mn.us</a>		
<i>Distributor's Data Set Identifier</i>	Kanabec 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.		

***Transfer Format  
Name***

***Transfer Format  
Version Number***

***Transfer Size*** mb for data, mb for associated maps

***Ordering  
Instructions***

Kanabec County's aggregate resource spatial datasets (shapefiles & file geodatabase) are included in the file kanabecdata.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.

***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***

2012

***Contact Person  
Information***

Aggregate Resource Mapping Program, Industrial Minerals Geologist or GIS Specialist  
Minnesota Department of Natural Resources, Division of Lands and Minerals  
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Phone: 651-259-5959  
FAX: 651-296-5939  
E-mail: [aggregatemap@state.mn.us](mailto:aggregatemap@state.mn.us)

***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>

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Table Name	Field Name	Definition	Valid Values	Descriptions
kana_fobs.dbf	FIELD_ID	Text, 8	Ex: kana_1	Unique identifiers used in the field.
	SITETYPE_1	Text, 25	See Below	
			Excavation	Badger holes, trenches, construction areas, or foundations.
			Exposure	Outcrop of material from erosional processes.
			Gravel Pit	Gravel pits exposing sand and gravel material.
			Other	Based on communication or observation.
			Rock Pile	Conspicuous pile of rocks, generally ranging in size from cobble to boulder.
	SITETYPE_2	Text, 25	See Below	Further description of the observation site specified in SITE_TYPE1.
			Animal Hole	A hole dug by an animal which exposes sediment.
			ATV Trail	Sediment exposed within trail for ATVs.
			Communication	Contact with landowners, drillers, and experts verifying well records.
			Construction	Mining or digging due to construction.
			Ditch	Material exposed in a ditch due to a slump or landscaping that has removed vegetation.
			Drainage	Material exposed in a small water drainage feature.
			Driveway	Surficial material exposed in driveway.
			Embankment	Sediment exposed in a slope or hill where vegetation is patchy or lacking.
			Gravel Pit	Materials exposed in gravel pit.
			Observation	Sediment or vegetation observed
			River Cut	Sediment exposed by river erosion.
			Road Cut	Materials exposed in a road cut.
			Rock Pile	Conspicuous pile of rocks, generally ranging in size from cobble to boulder.
			Surface	Exposures of bedrock/material on the ground surface.

			Stream	Sediment visible in the bottom of a stream
			Telephone Pole	Sediment exposed due to drilling and installation of new telephone poles.
			Tree Tip	Exposure after a tree blows over and roots are tilted out of the ground revealing underlying sediment.
			Trench	Exposure of sediment viewed in human-made linear trench excavation
			Vegetation	Vegetation type that is indicative of a certain soil texture
	MATERIAL_1	Text, 25	See Below	Describes the primary type of material encountered at each observation site and does not necessarily reflect stratigraphic order.
			Boulders	Presence of bedrock boulders.
			Clay	Clay is a very fine-grained sediment that is less than 0.004 mm in size.
			Cobbles	Clasts that range in size from 3 inches to 10 inches.
			Did not Observe	Sediment texture was not observed
			Gravel with Sand	Sediment that contains a mixture of rocks in varying sizes ranging from 0.0625 to 64 mm. This description is given to sediment that contains greater than 50% by volume gravel.
			Organics	Soil that contains decaying organic matter.
			Rocky Soil	Observation based on surficial exposure usually within tilled field or pasture with little vegetation.
			Sand	Sand is composed of rocks and minerals that range in diameter from 0.0625 to 2 mm.
			Sand and Gravel	Sediment that contains a mixture of rocks in varying sizes ranging from 0.0625 to 64 mm. This description is given to sediment that contains greater than 15% by volume gravel.
			Sand minor Gravel	Sediment that contains a mixture of rocks in varying sizes ranging from 0.0625 to 64 mm. This description is given to sediment that contains approximately less than 7% by volume gravel.
			Sand with Gravel	Sediment that contains a mixture of rocks in varying sizes ranging from

				0.0625 to 64 mm. This description is given to sediment that contains less than 15% by volume gravel.
			Silt	A fine grained sediment that has a diameter between 0.004 to 0.0625 mm.
			Silty Sand	Sand that contains some silt.
			Till	A term used to describe the unsorted sediment deposited by glaciers- contains a mixture of clay, silt, sand, gravel and boulders.
	MATERIAL_2	Text, 25	See Below	Describes the secondary (not primary) type of material at each observation site.
			Alluvium	Fine sediment ranging from fine sand to clay deposited by river or stream.
			Boulders	Presence of bedrock boulders.
			Clay	Clay is a very fine-grained sediment that is less than 0.004 mm in size.
			Cobbles	Clasts that range in size from 3 inches to 10 inches.
			Organics	Developed P soil horizon, indicating organic material and a high water table.
			Sand	Sand is composed of rocks and minerals that range in diameter from 0.0625 to 2 mm.
			Sand and Gravel	Sediment that contains a mixture of rocks in varying sizes ranging from 0.0625 to 64 mm. This description is given to sediment that contains greater than 15% by volume gravel.
			Sand with Gravel	Sediment that contains a mixture of rocks in varying sizes ranging from 0.0625 to 64 mm. This description is given to sediment that contains less than 15% by volume gravel.
			Silt	A fine grained sediment that has a diameter between 0.004 to 0.0625 mm.
			Silty Sand	Sand that contains some silt.
			Till	A term used to describe the unsorted sediment deposited by glaciers- contains a mixture of clay, silt, sand, gravel and boulders. Within the boundaries of Project of MPES Report 384 almost all visible till was created by the Superior lobe. There is some influence of the Des Moines lobe in the extreme south east corner



				of the county. Generally the till has a silty matrix and is tan in color.
			Topsoil	Presence of developed A soil horizon.
	FIELDDESC	Text, 200	Ex: Drill Hole (0-9 ft) 0-6 Till, 6-9 Gravel.	A short field description of the observation site.
	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 by possibly using one or both the modifier and value. 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).
	Sampled	Text, 3	Yes or No	For Kanabec County only select test holes were sampled. See kana_testholes for that information.
	Gravel_pct	Double	Ex: -999, 50	For Kanabec County only select test holes were sampled. See kana_testholes for that information.