

## Aitkin County, Minnesota - Aggregate Resources

### Test Holes and Sampling

#### aitk\_testholes & aitk\_testhole\_sampling

---

### Metadata Summary

<b>Originator</b>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section
<b>Abstract</b>	<p>These two test hole datasets (aitk_testholes &amp; aitk_testhole_sampling) were completed to verify the presence or absence of sand and gravel at selected test hole sites in Aitkin County. A total of 245 test hole sites were captured. Of these 140 were drilled, 76 were grabbed with a shovel, and 29 were taken using a backhoe. These sites are displayed in the feature class titled 'aitk_testholes' and are also related to the table 'aitkin_testhole_sampling' for sampling results. The test holes were captured in the field by two geologists who worked on this project at separate times and did not overlap. Steve Kostka did test hole field work in the fall of 2009 and 2010. Carrie Jennings did test hole field work from May through October of 2013. A total of 126 samples were taken from 120 of the 245 test hole sites for construction aggregate gradations and quality. Selected samples from test holes were analyzed for size gradations by the DNR and for construction aggregate quality at a MnDOT material laboratory. Sample quality has been characterized at the reconnaissance level by 48 MnDOT gradational and aggregate quality samples and 78 DNR gradational samples. The MnDOT concrete lithological exam identifies certain deleterious rock types present within a sample and calculated as a weight percent. Sampled data results are in the related table titled 'aitk_testhole_sampling'.</p>
<b>Browse Graphic</b>	none available
<b>Time Period of Content Date</b>	2013
<b>Currentness Reference</b>	Data were collected between 2010 and 2013.
<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>	<p>Aitkin County's aggregate resource spatial datasets (shapefiles &amp; 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></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>Online Linkage</b>	<p><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.</p>

---

## Full Metadata

### Aitkin County, Minnesota - Aggregate Resources: Test Holes and Sampling **aitk\_testholes & aitk\_testhole\_sampling**

#### Section 1

#### Identification Information

<b><i>Originator</i></b>	Minnesota Department of Natural Resources, Division of Lands and Minerals, Mineral Potential Evaluation Section
<b><i>Title</i></b>	Aitkin County Aggregate Resources: aitk_testholes and aitk_testhole_sampling (Test Hole Drilling and Sampling)
<b><i>Abstract</i></b>	<p>These two test hole datasets (aitk_testholes &amp; aitkin_testhole_sampling) were completed to verify the presence or absence of sand and gravel at selected test hole sites in Aitkin County. A total of 245 test hole sites were captured. Of these 140 were drilled, 76 were grabbed with a shovel, and 29 were taken using a backhoe. These sites are displayed in the feature class titled 'aitk_testholes' and are also related to the table 'aitkin_testhole_sampling' for sampling results. The test holes were captured in the field by two geologists who worked on this project at separate times and did not overlap. Steve Kostka did test hole field work in the fall of 2009 and 2010. Carrie Jennings did test hole field work from May through October of 2013. A total of 126 samples were taken from 120 of the 245 test hole sites for construction aggregate gradations and quality. Selected samples from test holes were analyzed for size gradations by the DNR and for construction aggregate quality at a MnDOT material laboratory. Sample quality has been characterized at the reconnaissance level by 48 MnDOT gradational and aggregate quality samples and 78 DNR gradational samples. The MnDOT concrete lithological exam identifies certain deleterious rock types present within a sample and calculated as a weight percent. Sampled data results are in the related table titled 'aitkin_testhole_sampling'.</p>
<b><i>Purpose</i></b>	To summarize the test hole sites and samples taken in Aitkin County, Minnesota.
<b><i>Time Period of Content Date</i></b>	2013
<b><i>Currentness Reference</i></b>	Data were collected between 2010 and 2013.
<b><i>Progress</i></b>	Complete
<b><i>Maintenance and Update Frequency</i></b>	None planned
<b><i>Spatial Extent of Data</i></b>	Aitkin County, Minnesota
<b><i>Bounding Coordinates</i></b>	-93.81 -93.05 47.16 46.15
<b><i>Place Keywords</i></b>	Aitkin County, Minnesota
<b><i>Theme Keywords</i></b>	Test hole drilling, aggregate quality, sieve, gradations, aggregate resources, surficial geology.
<b><i>Use Constraints</i></b>	Acknowledgement of the Minnesota Department of Natural Resources is appreciated for products derived from these data.
<b><i>Contact Person Information</i></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>

## ***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***

The data points were gathered at the location where the test holes were drilled. Additional information is given in the Lineage section.

### ***Horizontal Positional Accuracy***

The differential correction of the GPS unit for GPS located sites is +/- 3 meters.

### ***Vertical Positional Accuracy***

Not applicable.

### ***Lineage***

A tablet PC, a Garmin GPS Bluetooth unit, 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. Testhole points and associated tabular attribute were updated in real time as much as possible. 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. At other times a portable Garmin Etrex or a GPS equipped iPhone were used instead of the above mentioned hardware and software. 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 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

## 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 North

## Section 5 Entity and Attribute Information

<i>Entity and Attribute Overview</i>	Test hole site data contains information about the test hole id, type, size, depth, materials, geologic description, depth to water, sand and gravel thickness, overburden, sampled, sample interval, link to MnDOT sampling form, and geologist. Test hole sampling data contains information about sample lab, ids, intervals, gradation data, and aggregate quality data.
<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>	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:  
[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*                      2014

*Contact Person*  
*Information*                      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: [kevin.hanson@state.mn.us](mailto:kevin.hanson@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>

---

## Aitkin Testholes Feature Class – aitk\_testholes

Field Name	Field Name Alias	Definition	Valid Values	Descriptions
PRJCT_ID	MPES Project ID Number	Text, 6	Ex: 381-00	Mineral Potential Evaluation Section's unique project ID
PRJCT_DESC	MPES Project Description	Text, 100	Ex: Aitkin County Aggregate Mapping	Mineral Potential Evaluation Section's project title
TH_ID	Test Hole ID	Text, 10	Ex: DH-047	ID given to each test hole site
TH_TYPE	Test Hole Type	Text, 100	Ex: Backhoe, Geoprobe, Giddings Auger, Hand Shovel	Type of test hole: drilling, shovel, or backhoe
TH_DESC	Type Description	Text, 50	Ex: 2 cubic feet, 5 inch, 6 inch	Size of auger or backhoe bucket. Hand shovel size not determined.
TH_DEPTH	Test Hole Depth	Double	Ex: 12, 8, -999	Depth of test hole: drill hole or backhoe bucket. Depth of shovel not determined. (-999 is a null value)
PRIM_MAT	Primary Material	Text, 75	Ex: sand with gravel, clay, sand, diamict	The material that is most apparent in the test hole. General descriptions of materials provided below 'End Material'.
SEC_MAT	Secondary Material	Text, 75	Ex: sand with gravel, clay, sand, diamict	The material that is second most apparent in the test hole. General descriptions of materials provided below 'End Material'.
END_MAT	End Material	Text, 75	Ex: sand with gravel, clay, sand, diamict	The material found at the end of test hole. General descriptions of materials provided below.
			Clay	Clay is a very fine-grained sediment that is less than 0.004 mm in size.
			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 organic horizon that contains decaying organic matter, commonly
			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
			Silty Clay	Clay that contains some silt.
			Till	A term used to describe the unsorted sediment deposited directly by glaciers- contains a mixture of clay,
			Diamicton (Diamict)	A term used to describe the unsorted sediment most likely originally deposited directly by glaciers but modified after initial deposition- contains a mixture of clay, silt, sand, gravel and boulders.
TH_DESCRPT	Test Hole Description	Text, 255		The geologic field description of the test hole site and materials.
DEPTH2WT	Depth to Water Table	Text, 10		Expresses depth to water table in feet. (N/A is Not Available)
SG_THICK	Sand and Gravel Total Thickness	Text, 12	Ex: 0, >10, <10, N/A	Expresses sand and gravel thickness in feet. (N/A is Not Available)
OVERBURDEN	Overburden	Double	Ex: 0, 3, 20, -999	Expresses overburden thickness in feet. (-999 is a null value)

SAMPLED	Sampled (Yes/No)	Text, 5	Ex: Yes, No	Was this site sampled for gradations or aggregate quality?
SAMP_INT	Sample Interval	Text, 10	Ex: 0-8, 8-16, 6-12, No Sample	Sample interval in feet
SAMP_TOT	SAMP_TOT	Double	Ex: 8 , 16, -999	Total sample interval in feet (-999 is a null value)
	Geologist	Text, 75		Geologist at the test hole site

Aitkin Testhole Sampling Table – aitk\_testhole\_sampling

Field Name	Field Name Alias	Definition	Valid Values	Descriptions
TH_ID	Test Hole ID	Text, 10	Ex: DH-274, DH-286	ID given to each test hole site
TH_SAMPID	Test Hole Sample ID	Text, 14	Ex: DH-274-01, DH-275-01	ID given to each test hole sample
SAMP_LAB	Sample Lab	Text, 50	Ex: MnDOT, MN DNR - Hibbing	What lab processed the sample?
COMP_NMBR	Was the Sample a Composite?	Text, 3	Yes or No	Was the sample a composite? (-999 is a null value)
COMP_DESC	Number of Holes in the Composite?	Short Integer	Ex: 4, -999	Number of samples composited? (-999 is a null value)
SAMP_FROM	Test Hole IDS Composited	Text, 50	Ex: DH_046_a, DH_046_c, DH-046_3, DH_046_f	All test hole field IDs used in the composite sample.
SAMP_FROM	Sample From Interval	Short Integer	Ex: 1, 4, 0	Sample beginning depth (in feet) from surface. (-999 is a null value)



SAMP_TO	Sample To Interval	Short Integer	Ex: 12, 9, 18	Sample end depth (in feet) from surface. (-999 is a null value)
PCT_4IN	Percent Passing 4 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 4 inch (-999 is a null value)
PCT_3IN	Percent Passing 3 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 3 inch (-999 is a null value)
PCT_2_5IN	Percent Passing 2 1/2 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 2 ½ inch (-999 is a null value)
PCT_2IN	Percent Passing 2 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 2 inch (-999 is a null value)
PCT_1_5IN	Percent Passing 1 1/2 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 1 ½ inch (-999 is a null value)
PCT_1_25IN	Percent Passing 1 1/4 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 1 ¼ inch (-999 is a null value)
PCT_1IN	Percent Passing 1 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 1 inch (-999 is a null value)
PCT_3_4_IN	Percent Passing 3/4 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve ¾ inch (-999 is a null value)
PCT_5_8IN	Percent Passing 5/8 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 5/8 inch (-999 is a null value)
PCT_1_2IN	Percent Passing 1/2 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve ½ inch (-999 is a null value)
PCT_3_8IN	Percent Passing 3/8 Inch	Short Integer	Ex: 100, 94, 61	Percent passing sieve 3/8 inch (-999 is a null value)
PCT_NUM4	Percent Passing #4 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #4 (-999 is a null value)
PCT_NUM8	Percent Passing #8 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #8 (-999 is a null value)
PCT_NUM10	Percent Passing #10 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #10 (-999 is a null value)
PCT_NUM16	Percent Passing #16 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #16 (-999 is a null value)
PCT_NUM30	Percent Passing #30 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #30 (-999 is a null value)

PCT_NUM40	Percent Passing #40 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #40 (-999 is a null value)
PCT_NUM50	Percent Passing #50 Sieve	Short Integer	Ex: 100, 94, 61	Percent passing sieve #50 (-999 is a null value)
PCT_NUM100	PCT_NUM100	Short Integer	Ex: 100, 94, 61	Percent passing sieve #100 (-999 is a null value)
PCT_NUM200	Percent Passing #200 Sieve	Double	Ex: 11.5, 19.3	Percent passing sieve #200 (-999 is a null value)
PCT_GRVL	Percent Gravel	Double	Ex: 30, 42	Percent gravel (-999 is a null value)
PCT_SAND	Percent Sand	Double	Ex: 70.7, 17.9	Percent sand (-999 is a null value)
PCTSILTCLY	Percent Silt Clay	Double	Ex: 11.2, 5.6	Percent silt and clay
PCTSHLSAND	Percent Shale in Sand	Double	Ex: 0.1, 0, -999	Percent shale in sand -999 indicate a sample that was not tested.
PCTTOTSHL4	Percent Total Shale +4	Double	Ex: -999, 0.1	Percent total shale +4. -999 indicates a sample that was not tested.
PCTSAMPShL	Percent Sample Shale	Double	Ex: -999, 0.1	Percent total sample shale. -999 indicates a sample that was not tested.
PCTSNDSTN	Percent Sandstone	Double	Ex: -999, 0.1, 10.7	Percent sandstone. -999 indicates a sample that was not tested.
PCTSPL_ARG	Percent Spall Argillite	Double	Ex: 0.9, 2.2, -999	Percent spall argillite -999 indicates a sample that was not tested.
PCT_CARB	Percent Carbonate	Double	Ex: 0.9, 2.2, -999	Percent carbonate. -999 indicates a sample that was not tested.
PCT_IRONOX	Percent Iron Oxide	Double	Ex: 0.1, 0.7, -999	Percent iron oxide
PCT_OCHRE	Percent Ochre	Double	Ex: -999	Percent ochre. -999 indicates a sample that was not tested.
PCT_UNCHRT	Percent Unsound Chert	Double	Ex: -999, 0.31, 0.23	Percent unsound chert. -999 indicates a sample that was not tested.

PCT_SCHIST	Percent Schist	Double	Ex: -999, 0.3, 0.31	Percent schist. -999 indicates a sample that was not tested.
PCTMISCSP	Percent Misc. Spall	Double	Ex: -999, 0.04, 1.43	Percent miscellaneous spall. -999 indicates a sample that was not tested.
PCT_TS_SPL	Percent Total Sample Spall	Double	Ex: 0.3, 1.1, -999	Percent total sample spall -999 indicates a sample that was not tested.
PCTBA_SPL4	Percent BA Spall +4	Double	Ex: 4.2, 0.8, -999	Percent BA spall +4 -999 indicates a sample that was not tested.
PCTNSPLARG	Percent Non Spall Argillite	Double	Ex: -999, 0.5	Percent Non Spall Argillite -999 indicates a sample that was not tested.
PCTDISROCK	Percent Disintegrating Rock	Double	Ex: -999, 0.2	Percent disintegrating rock -999 indicates a sample that was not tested.