

# Aggregate Resources Task Force

Final Report to the Minnesota Legislature

Senator Carrie Ruud, Co-Chair

Representative Chris Swedzinski, Co-Chair

Senator Carrie Ruud

Senator Bill Ingebrigtsen

Senator Dan Schoen

Senator Nick Frentz

Representative Chris Swedzinski

Representative Dale Lueck

Representative Rob Ecklund

Representative Mike Sundin

Established by Laws of Minnesota 2016, Chapter 189, Article 3, Section 50.

January 15, 2018

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## OVERVIEW

Established by Laws of Minnesota 2016, Chapter 189, Article 3, Section 50, an eight-member task force was created to study and provide recommendations on:

- The Department of Natural Resources' and Metropolitan Council's aggregate mapping progress and needs;
- The effectiveness of recent aggregate tax legislation and the use of revenues collected by counties;
- The use of state funds to preserve aggregate reserves; and
- Local land use and permitting issues, environmental review requirements, and the impacts of other state regulations on aggregate reserves.

The Aggregate Resources Task Force consisted of four duly elected members of the Minnesota House of Representatives, the Speaker of the House appointed two members of the majority party and two members of the minority party, with one member being the chair of the committee with jurisdiction over aggregate mining. Kurt Daudt, Speaker of the House appointed Representatives Rob Ecklund, Dale Lueck, Mike Sundin, and Chris Swedzinski.

The task force also included four duly elected members of the Minnesota Senate appointed by the Senate Subcommittee on Committees of the Committee on Rules and Administration, including two members of the majority party and two members of the minority party, with one member being the chair of the committee or division with jurisdiction over natural resources finance. Senators Nick Frentz, Bill Ingebrigtsen, Carrie Ruud, and Dan Schoen were appointed. Of the eight total members of the task force, Representative Swedzinski and Senator Ruud co-chaired monthly proceedings of the Aggregate Resources Task Force, often referred to by its acronym "ARTF".

Meetings of the task force were coordinated by the Legislative Coordinating Commission. The Task Force held four hearings between July and December 2017. Meetings consisted of testimony from aggregate mining experts, the Minnesota Department of Natural Resources, the Minnesota Department of Transportation, members of the Aggregate & Ready Mix Association of Minnesota, business owners, and counties from across the state. Meetings were also open to public comment. Members toured an aggregate mine in Empire Township, MN where members learned more about aggregate mine zoning issues, learned the benefits and importance of mine reclamation, and how communities plan for the life cycle of a mine. The task force was directed to submit a written report to the chairs of the House of Representatives and senate committees and

divisions with jurisdiction over aggregate mining and natural resources finance containing the findings of the study no later than January 15, 2018.

#### **Legislative Charge**

Established by Laws of Minnesota 2016, Chapter 189, Article 3, Section 50.

#### Sec. 50. **AGGREGATE RESOURCES TASK FORCE.**

##### **Subdivision 1.** Creation; membership.

(a) The Aggregate Resources Task Force consists of eight members appointed as follows:

(1) the speaker of the house shall appoint four members of the house of representatives to include two members of the majority party and two members of the minority party, with one member being the chair of the committee with jurisdiction over aggregate mining; and

(2) the senate Subcommittee on Committees of the Committee on Rules and Administration shall appoint four members of the senate to include two members of the majority party and two members of the minority party, with one member being the chair of the committee or division with jurisdiction over natural resources finance.

(b) The appointing authorities must make their respective appointments no later than July 15, 2016.

(c) The first meeting of the task force must be convened by the chairs of the house of representatives and senate committees specified in paragraph (a) who will serve as cochairs of the task force.

**Subd. 2.** Duties. The task force must study and provide recommendations on:

(1) the Department of Natural Resources' and Metropolitan Council's aggregate mapping progress and needs;

(2) the effectiveness of recent aggregate tax legislation and the use of the revenues collected by counties;

(3) the use of state funds to preserve aggregate reserves; and

(4) local land use and permitting issues, environmental review requirements, and the impacts of other state regulations on aggregate reserves.

**Subd. 3.** Report. No later than January 15, 2018, the task force shall submit a report to the chairs of the house of representatives and senate committees and divisions with jurisdiction over aggregate mining and natural resources finance containing the findings of the study.

**Subd. 4.** Expiration. The Aggregate Resources Task Force expires 45 days after the report and recommendations are delivered to the legislature or on June 30, 2018, whichever date is earlier.

## **MEETINGS**

12:30 p.m. Monday, July 24, 2017 (Representative Swedzinski presided)

- Farmington Library, Farmington, MN

10:00 a.m. Thursday, September 14, 2017 (Senator Ruud presided)

- Minnesota Senate Building, St. Paul, MN

10:00 a.m. Tuesday, October 10, 2017 (Representative Swedzinski presided)

- State Office Building, St. Paul, MN

10:00 a.m. Tuesday, December 12, 2017 (Senator Ruud presided)

- Minnesota Senate Building, St. Paul, MN

The final meeting of the ARTF was held on December 12<sup>th</sup>, 2017. At the meeting, recommendations were adopted which offer a broad framework in which further legislative action may be pursued. Minutes from all ARTF meetings are found in the following pages.

## **PARTICIPANTS**

Noted in further detail in the minutes from ARTF hearings, these stakeholders provided input on topics discussed at ARTF hearings:

- Fred Corrigan, Executive Director, MN Aggregate Ready Mix Association, Lobbyist
- Heather Arends, DNR Mineral Protection Section Manager
- Kirsten Pauly, PE, PG, Sunde Engineering
- Terry Holmes, Empire Township Board Chair
- Mike Caron, Tiller Corporation Director of Land Use Affairs
- Angie Berg, Stearns County Environmental Services, Land Use Division
- Kevin Hanson, DNR Cartographer
- Glenn Engstrom, MnDOT, Director of the Office of Materials and Road Research
- Michelle McPherson, Mille Lacs County Land Services Director
- Steve Kubista, Chippewa County Highway Engineer

## RECOMMENDATIONS

Below are the recommendations that were adopted at the December 2017 meeting of the Aggregate Resources Task Force. Recommendations are based upon the information gathered at ARTF hearings and ARTF member input. Recommendations cover the necessary topics required by statute with additional recommendations made after discussion among members.

### **The Department of Natural Resources and Metropolitan Council's Aggregate Mapping Progress and Needs:**

1. The Aggregate Resources Task Force Recommends the Legislature fund the Department of Natural Resources Aggregate Mapping Program to complete aggregate mapping in counties across the state. Members recommend funding the mapping program with \$950,000 per year for ten years. The Minnesota Department of Natural Resources shall work with the Legislature to find an appropriate funding mechanism, such as a general fund appropriation or LCCMR. Members recommend the Minnesota Department of Natural Resources and the Minnesota Department of Transportation investigate the possibility of working on a regional mapping approach if regional mapping can lead to financial and time efficiencies. If a regional mapping approach is to be implemented, waitlisted counties must be completed prior to moving to a regional mapping approach. The Department of Natural Resources reclamation handbook should also be updated using funding for the Aggregate Mapping Program.

Context:

The Minnesota Department of Natural Resources uses their Aggregate Mapping Program to map counties for aggregate deposits. This mapping tool, available by [following this link](#), provides citizens, counties, trade associations, and businesses with GIS mapping information on where aggregate deposits are located. Knowing where deposits are located is essential information for municipalities planning development.

After members of the ARTF discussed the mapping progress across the state with the Department of Natural Resources, members found that:

- Twenty-eight counties have been mapped, including the seven-county metropolitan area
- Two counties are currently being mapped
- Fifty-seven counties need to be mapped
- Fully funding the Department of Natural Resources Aggregate Mapping Program will complete an estimated six counties per year.

Further information on the Department of Natural Resources Aggregate Mapping Program proposal can be found in Appendix A.

**The Effectiveness of Recent Aggregate Tax Legislation and the Use of the Revenues Collected by Counties:**

2. The Aggregate Resources Task Force recommends that the Office of the Legislative Auditor conduct a program audit of the aggregate tax system within the counties, including an examination of the best management practices in use by the counties to determine how well the current aggregate tax program, administered at the county level, is working. This program audit must include a review of how the tax revenue is being used and distributed in jurisdictions receiving proceeds from the aggregate tax pursuant to Minnesota Statute, section 298.75.

Context:

Pursuant to Minnesota Statute, section 298.75, counties can implement an aggregate production tax. The operator production tax is 21.5 cents per cubic yard or 15 cents per ton of aggregate material excavated in the county. The statute also stipulates how the tax revenue is to be divided and used. Members recommend a program audit to further understand how well the current aggregate production tax is working for the counties, and better understand if the proceeds of taxes are being divided according to Minnesota Statute, section 298.75.

Any program audit conducted by the Office of the Legislative Auditor must:

- Report on how revenues are distributed between maintenance, construction, and reconstruction of roads, highways, and bridges.
- Report whether tax revenue is given preference to roads, highways, and bridges that service or are impacted by aggregate operations.

- Report if the tax revenue is distributed on a project or formula basis.
- Report on how tax revenue deposited in the special reserve fund (for uses such as restoration of abandoned pits, conservation efforts, or other environmental needs) has been expended.

**The Use of State Funds to Preserve Aggregate Reserves:**

3. The Aggregate Resources Task Force recommends that the Legislature fund the Department of Natural Resources Aggregate Mapping Program proposal to better understand the location of aggregate reserves across the state. Mapping information should be used by the Department of Natural Resources to provide technical assistance as needed to local units of government in making sound land use decisions that preserve the availability of aggregate resources.

Context:

Aggregate deposits vary greatly from one region to another. Some regions of the state have aggregate with a wide discrepancy in quality. Quality aggregate is needed to complete infrastructure projects across the state. Members recommend funding the Aggregate Mapping Program as an essential way to better understand where aggregate is located. According to the Minnesota Geologic Survey, seventy percent of aggregate reserves in the Twin Cities area covered by development and are no longer available for use. By better understanding where aggregate reserves are located, counties and municipalities will be able better plan for development without restricting access to aggregate reserves.



**Local Land Use and Permitting Issues, Environmental Review Requirements, and the Impacts of Other State Regulations on Aggregate Reserves**

4. The Aggregate Resources Task Force recommends and encourages counties, townships, and municipalities to review and update their comprehensive plans to evaluate the impact of zoning on current and future accessibility to aggregate resources.
5. The Aggregate Resources Task Force recommends, where aggregate information is available, that the state, counties, townships, and municipalities assess the current and future impacts of all land use designations and easements that restrict access to aggregate resources
6. The Task Force recommends further study of statutory and regulatory changes to the process by which conditional use and interim use permits related to aggregate resources are issued and reviewed.

Context:

Comprehensive planning is essential to preserving access to aggregate resources. A comprehensive understanding of where aggregate is located benefits counties and municipalities in the zoning and planning process by promoting orderly and environmentally sound development. Counties should also be aware of how restricting access to aggregate may affect future aggregate availability at a county and regional level. Members did discuss conditional use permits and interim use permits in relation to aggregate mining, but did not come to a formal conclusion on action to be taken on the subject.

**Aggregate Mine Reclamation:**

7. The Aggregate Resources Task Force recommends that the state, counties, municipalities, and companies emphasize mine planning and reclamation during the permitting process of new aggregate mines and promote reclamation efforts for existing mines that are no longer productive.

Context:

During the July 24 field trip, members experienced the benefits of mine reclamation on the environment and surrounding communities. In Empire Township, a pit went through the reclamation process where the end use resulted in a school being built on the

reclaimed mine. There are other examples of private companies purchasing old state pits, many abandoned in the 1980's, and reclaiming them, which adds value to a once unusable piece of land. Across the state, old aggregate mines are being reclaimed for – whether it is for a neighborhood development, farmland, or another use. While there is no state or federal reclamation requirement, the Aggregate Resources Task Force strongly encourages reclaiming land at the end of a mine lifecycle and leaving the site in better condition than when the mine first opened.

# MEETING MINUTES

## Aggregate Resources Task Force Monday, July 24, 2017

### MEMBERS PRESENT:

Sen. Carrie Ruud, Co-chair  
Rep. Chris Swedzinski, Co-chair  
Rep. Dale Lueck  
Rep. Mike Sundin  
Sen. Bill Ingebrigtsen

### EXCUSED:

Sen. Nick Frentz  
Sen. Dan Schoen  
Rep. Rob Ecklund

Rep. Swedzinski called the Aggregate Resources Task Force meeting to order at 12:35 p.m. on Monday, July 24, 2017 at the Farmington Public Library, Farmington, Minnesota. A quorum was present.

Fred Corrigan, Lobbyist and Executive Director of Aggregate and Ready Mix of Minnesota provided an overview of aggregate resources and ad hoc meetings which have occurred.

Heather Arends from the DNR presented the Aggregate Industry Ad-Hoc Committee Report.

Kirsten Pauly, P.E., P.G. from Sunde Engineering, LLC provided a PowerPoint presentation “Aggregates 101”.

Heather Arends, Manager, Mineral Potential Section, Division of Lands and Minerals, Department of Natural Resources provided a PowerPoint presentation regarding the DNR (County Geologic) Mapping Program.

Mike Caron, Director of Land Use Affairs at the Tiller Corp. addressed some of the costs related to hauling or recycling on site, as well as other economic implications.

Terry Holmes, Empire Township Board Chair provided an overview and history regarding mining in Empire Township.

The meeting was adjourned at 2:10 p.m.

*The Task Force then took a bus tour to the Tiller Corporation’s aggregate mining and asphalt site, and to the Aggregate Industries’ aggregate mining and ready mix concrete plant.*

**Aggregate Resources Task Force Meeting**  
Thursday, September 14, 2017

**MEMBERS PRESENT:**

Sen. Carrie Ruud, Co-chair  
Sen. Nick Frentz  
Rep. Rob Ecklund

**MEMBERS EXCUSED:**

Rep. Chris Swedzinski, Co-chair  
Rep. Dale Lueck  
Rep. Mike Sundin  
Sen. Bill Ingebrigtsen  
Sen. Dan Schoen

Sen. Ruud called the Aggregate Resources Task Force meeting to order at 10:08 a.m. on Thursday, September 14, 2017 at the Minnesota Senate Building, Room 2308. A quorum was not present.

**Presentations:**

MACPZA legislative initiatives and use of aggregate maps in Stearns County  
*Angie Berg - Stearns County Environmental Services – Land Use Division*

Aggregate mapping: information behind aggregate maps and public access  
*Kevin Hanson – DNR Cartographer (PowerPoint presentation & video were provided.)*

MNDOT future aggregate needs and maximization of resources  
Glenn Engstrom – Director of the Office of Materials & Road Research, MNDOT

Discussion of Legislative Topics – Fred Corrigan Executive Director, MN Aggregate Ready Mix Association and Heather Arends, DNR Mineral Potential Section Manager  
*Appropriation for DNR Aggregate Mapping*  
*Reclamation*  
*Comprehensive Planning*

Adjourn 11:50 a.m.

## **Aggregate Resource Task Force Meeting**

October 10, 2017

### **Members Present:**

Rep. Chris Swedzinski, Co-chair  
Sen. Carrie Ruud, Co-chair  
Rep. Mike Sundin  
Sen. Nick Frentz (via telephone)

### **Members Excused:**

Sen. Bill Ingebrigtsen  
Sen. Dan Schoen  
Rep. Rob Ecklund  
Rep. Dale Lueck

Representative Swedzinski called the Aggregate Resources Task Force meeting to order at 10:05 a.m. on Tuesday, October 10, 2017, at the State Office Building, Room 200. A quorum was not present.

### **Presentations:**

Michele McPherson, Mille Lacs County Land Services Director, presented on land use planning and mining districts in Mille Lacs, which included a web presentation on GIS Mapping access:  
[http://www.co.mille-lacs.mn.us/index.asp?Type=B\\_BASIC&SEC={CEEDA7A3-FEBD-4D5B-AA4A-0F770AB3256B}](http://www.co.mille-lacs.mn.us/index.asp?Type=B_BASIC&SEC={CEEDA7A3-FEBD-4D5B-AA4A-0F770AB3256B}).

Mike Caron, Tiller Corporation Director of Land Use Affairs provided a PowerPoint presentation: Comprehensive Planning, Mining Districts and Permitting: An Industry Perspective.

Heather Arends, DNR Mineral Potential Section Manager, provided a PowerPoint presentation: Distribution of aggregates in Minnesota.

Steve Kubista, Chippewa County Highway Engineer, presented information on Aggregate availability of Chippewa County.

There was no additional testimony.

**Aggregate Resources Task Force Meeting**  
Tuesday, December 12, 2017

**MEMBERS PRESENT:**

Sen. Carrie Ruud, Co-chair  
Sen. Nick Frentz  
Sen. Bill Ingebrigtsen  
Rep. Dale Lueck  
Rep. Mike Sundin

**EXCUSED:**

Sen. Dan Schoen  
Rep. Rob Ecklund  
Rep. Chris Swedzinski

Senator Carrie Ruud called the Aggregate Resources Task Force Meeting to order at 10:03 a.m. on Tuesday, December 12, 2017 at the Minnesota Senate Building, Room 2308. A quorum was present.

Representative Dale Lueck moved that the Minutes from 7/24/2017, 9/14/2017, and 10/10/2017 be approved.

**Motion Carried**

Topics included in the discussion of the Aggregate Resource Task Force Legislative Report:

- 1) Effectiveness of tax legislation and the use of revenues collected by county – Fred Corrigan
- 2) DNR Aggregate mapping progress and needs – Heather Arends
- 3) Use of state funds to protect aggregate reserves – Heather Arends
- 4) Local Land use and permitting issues, environmental review requirements, impacts of other state regulations on aggregate reserves – Fred Corrigan
- 5) Aggregate mine reclamation efforts – all  
Senator Ruud placed an emphasis on leaving the land in as good of or better condition than when the mine opened.

Meeting adjourned at 10:55 a.m.

## **ACKNOWLEDGEMENTS**

The members of the Aggregate Resources Task Force would like to thank all of those who have played a crucial role in the Task Force's success. The Task Force was staffed by legislative partisan and nonpartisan staff and staff from the Legislative Coordinating Commission. The Task Force appreciates the knowledge, time, and energy staff put in to making the Task Force a success.

Members would also like to thank Fred Corrigan, Executive Director of the Aggregate and Ready Mix Association of Minnesota, as well as Heather Arends, Mineral Protection Section Manager with the Minnesota Department of Natural Resources. Their time, expertise, input, and coordination were an immense asset to the Task Force. Additionally, the members of the Task Force would like to thank all those who came to testify at ARTF hearings.

## **APPENDIX A – Department of Natural Resources Aggregate Mapping Proposal**

### **2018 Aggregate Resources Task Force Construction Aggregate Maps**

#### **I. PROJECT STATEMENT**

Construction aggregate resources are critical in the development of sustainable, healthy, and economically thriving communities. In Minnesota, aggregate resources (sand, gravel, or crushed stone) is produced in all 87 counties within the state. As the key ingredient in building and maintaining public infrastructure, aggregate resources are the foundation of our modern society. With an aging infrastructure, some of which is older than its intended life span, these finite resources will be in higher demand. Many of the commercial aggregate pits are quarries are becoming depleted resulting in an on-going need to permit new sources. However, land-use conflicts make permitting future mines increasingly difficult. DNR aggregate resource maps provide information to local governments on the location of natural sand and gravel deposits and crushed stone resources within their jurisdiction. Having this information enables local governments to make better-informed decisions on zoning, growth and development, and protection of sensitive natural resources that overlap finite aggregate resources. Local sources of aggregate are economically and environmentally beneficial. The cost of transporting aggregates over long distances is often borne by the taxpayer, since the majority of aggregates are used for roads, bridges, and public works projects. For example, the single major expense for Minnesota’s townships is the Road and Bring Fund, totaling statewide more than \$100 million per year. Counties will be able to utilize the aggregate information in conjunction with other county natural resource and governmental data for day-to-day decision-making and as well as long-term planning.

Directed by statute (MN. Stat 84.84), DNR maps and inventories construction aggregate resources for local governments. Currently 61 counties in Minnesota have no information regarding the location of critical aggregate deposits (see figure 1). Information produced by the DNR provides local governments with technical information on the size, quality, and location of their aggregate resources. All observable gravel pits within a county will be surveyed noting information related to the status of the mine (active, inactive, reclaimed), the size of the mine, and depth to the water table, and other geologic descriptions. To verify high quality deposits, some aggregate resource deposits will be drilled and sampled.

#### **II. PROJECT PROPOSAL**

DNR proposes funding at \$450,000 for the first year and \$950,000 every subsequent year to complete an accelerated rate of mapping over the next 10 years, which includes 59 counties and 2 counties that are currently in progress. During this time the DNR will update “A Handbook for Reclaiming Sand and Gravel Pits in Minnesota” with new advances and technical information related permitting and reclaiming gravel pits. This proposal is scalable and can extend over longer timelines with reduced funding levels. The DNR will initially focus on waitlisted counties that have passed county board resolutions (see Table 1). Where possible, DNR will map waitlisted counties within the same region. Once waitlisted counties are completed, the DNR, in cooperation with Department of Transportation, will prioritize aggregate resource mapping into regions based upon natural scarcity, population growth, and economic growth centers. Mapping counties within the same geographic region will provide efficiencies in terms of project timelines and costs. A potential timeline of statewide completion is summarized in Table 2.

A county of average size, 650 to 750 total square miles, takes approximately one year to complete. Large-size counties require proportionally more time. There will be additional time at the front end to hire and train employees. At the requested funding level, the DNR would average a rate of completion of 3-8 counties per year after the first year of funding.



Upon completing an aggregate resources assessment, the county will receive an aggregate potential map published at 1:100,000 scale, which is compatible data sets used in land use planning, such as the County Geologic Atlas (Parts A and B) and the Minnesota Biological Survey. The county will also receive digital, geospatial datasets and databases. The public will be able to access this information in multiple formats: as a downloadable PDF map as well as within an interactive web-map on the DNR [website](http://www.dnr.state.mn.us/lands_minerals/aggregate_maps/online_maps/index.html):

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

### III. PROJECT TIMELINES

#### **YEAR 1: Initiate mapping of requested counties**

***FY19 Budget: \$450,000***

DNR will begin mapping waitlisted counties in the southwestern portion of the state: Kandiyohi, Redwood, Yellow Medicine, and Lyon County.

##### **Activity 1: *Compile Data and Hire Staff***

Program supervisor will hire two project geologists, one project specialist and a mining aide, train new staff and coordinate outreach with County staff and Commissioners. Geologists will compile all available and relevant gravel pit data, historic geologic maps, and reports within a region. GIS personnel will compile available digital data.

Budget:	\$450,000
Staff = 4.0 FTEs	
4 FTE (1FTE = \$100,000)	\$400,000
Travel for field work	\$50,000

##### **Activity 2: *Conduct Fieldwork and Sampling for Four Counties***

Three geologists and a project specialist will conduct fieldwork in four counties and survey gravel pits, collect geologic field observations, and identify aggregate bearing landforms.

#### **YEAR 2: Complete 4 maps and start 2-4 new counties**

***Budget: \$950,000***

##### **Activity 1: *Compile Data and Hire Staff***

Program supervisor will hire and train an additional two project geologists to map Chippewa and Lyon Counties. New geologists will compile all available and relevant gravel pit data, historic geologic maps, and reports. GIS personnel will compile available digital data. Aggregate deposits in all six counties will be explored and confirmed with 80 to 150 drill holes per county and sampling where aggregate is encountered.

Annual budget mapping rate ~6 counties/year:	\$950,000
Fully Staffed = 6.5 FTE	\$650,000
Travel for field work (~ \$10,000/county)	\$60,000
Drilling for 6 counties	\$150,000
Aggregate quality testing (Mn/DOT)	\$90,000

##### **Activity 2: *Creating Map and Digital Products***

During off seasons for field work, geologists will analyze the new data and the historic data. Geologists, with the assistance of GIS staff, will delineate and catalogue aggregate resource potential, identify aggregate resource trends, and produce draft aggregate maps. Draft maps will undergo a peer review process as well as be open for public comment. Supervisor will

provide technical assistance to geologist; oversee project standardizations between counties; and relay project status updates to Counties.

**Activity 3: Finalize and Release Final Datasets**

Geologists and GIS staff will edit, proof, and finalize data associated with each aggregate resource map (Kandiyohi, Swift, Yellow Medicine, and Redwood). Final data and maps will be released by the end of year 2 through outreach and meetings with the Board of County Commissioners; meetings with the county staff, which includes people from planning and zoning, highway department, information technology staff, and other interested organizations; and public meetings where geologists will be available to answer questions from the public. During the final stages of a county, geologist will begin the preparation work to start on the next county.

**Years 3 through 10:**

Budget \$950,000/year

Proposed progression of mapping summarized in Table 2 can be adapted to potential needs and priorities over time.

Table 1. Counties that have passed county board resolutions for Aggregate Mapping.

County [20 twps. is average size; multiplier indicates deviation from average]	Date of County Board Resolution Request	Estimate of person-years needed to complete the county.
1. Kandiyohi [1.5x] (in progress)	November, 2002	1.5
2. Becker [2x]	March, 2003	1.5
3. Swift [1x]	October, 2003	1
4. Yellow Medicine [1x]	November, 2003	1
5. Beltrami [4x]	March, 2004	2
6. St. Louis [9x]	December, 2004	2.5
7. Redwood [1x] (in progress)	September, 2005	1
8. Sibley [1x]	July, 2007	1
9. Lyon [1x]	May, 2010	1
10. Douglas [1x]	February, 2011	1
11. Cass County (3x)	June, 2012	2
12. Hubbard (1.5x)	May, 2013	1.5
13. Wadena (.75x)	May, 2013	0.75
14. Todd (1.5x)	May, 2013	1.5
15. Chippewa (1.5X)	May, 2017	1.5



Figure 2

