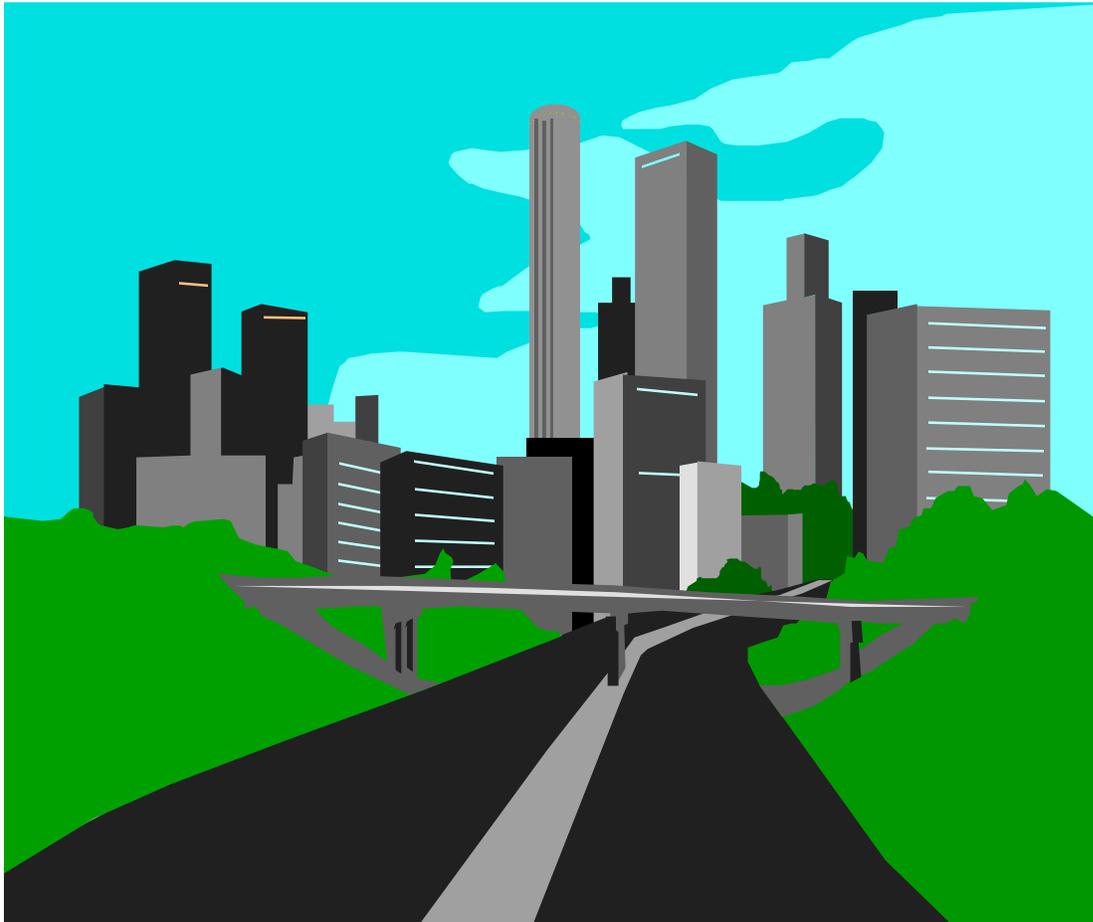


MINNESOTA'S AGGREGATE RESOURCES

Road to the 21st Century



**A report prepared by the Ad Hoc Aggregate Committee
for the Aggregate Resources Task Force.**

November 1998

SUMMARY

In 1997, a diverse group of organizations first met to discuss concerns related to aggregate mining in Minnesota. From that initial meeting, an “Ad Hoc Aggregate Committee” was formed that continues to meet today. The committee’s goals were to identify and highlight common areas of concern and urgency relative to aggregate resources. This report summarizes information collected from a variety of sources about Minnesota’s aggregate resources. These are the key points:

- Minnesota’s population will reach 4.8 million by the year 2000. Expanding population is driving an increase in consumption of aggregate materials.
- Aggregate is vital to the state’s infrastructure. Aggregate consumption is tied to a high standard of living and quality of life.
- The growth in the aggregate industry, roughly 2 to 3 % annually, reflects the state’s vigorous economy.
- Aggregate materials are a finite natural resource. Although once plentiful, aggregate sources are diminishing around the state from resource depletion as well as land uses that prohibit mining. Aggregate shortages are already occurring in some locations.
- Aggregate inventories are lacking in critical areas of the state. More effort is needed to identify aggregate resources before development occurs that precludes mining, to conserve known aggregate deposits, and to mine aggregate prior to development whenever possible.
- In populated areas, gravel mining is often an unwelcome neighbor. Conflicts between aggregate mining and other land uses are escalating.
- Public desire to preserve undeveloped lands for recreation or conservation purposes also poses a conflict with aggregate mining.

- The standards for reclamation after mining are variable. Many companies support good reclamation practices but some do not.
- Technical expertise to guide aggregate mining is sometimes not available in local units of government.
- The need to rebuild and repair aging infrastructure around the state such as bridges, airports, and roads is growing. Fulfilling this need will require large volumes of aggregate.
- The need for new infrastructure in growth corridors such as the suburbs surrounding the metropolitan area, Rochester, and St. Cloud as well as growth centers like Duluth, Moorhead, and Mankato among others is great. Fulfilling this need will require large volumes of aggregate.
- A record breaking transportation bonding bill was passed by the 1998 congress. Total government investment in the state's transportation infrastructure is expected to approach \$2.4 billion for the years 1997 to 1999. Such an investment will require large volumes of aggregate.
- Hauling aggregate greater distances to customers is costly. A city of 100,000 can expect to pay an additional \$1.3 million for the aggregate it uses in a year for each increase of 10 miles in haul distance.

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AD HOC AGGREGATE COMMITTEE

o Ad Hoc Aggregate Committee

In 1997, a diverse group of organizations met informally to discuss mutual concerns related to aggregate mining in Minnesota. From that initial meeting, an “Ad Hoc Aggregate Committee” was formed that continues to meet today. The committee has been enriched with participation from state agencies, local government, aggregate industry, trade associations, and The Nature Conservancy.

The committee’s goals were to identify and highlight common areas of concern and urgency relative to aggregate resources. This report summarizes key information collected from a variety of sources about Minnesota’s aggregate resources.



Ad Hoc Aggregate Committee

Organizations on the committee’s mailing list:

- Aggregate & Ready Mix Association of Minnesota
- Association of Minnesota Counties
- CAMAS America, Inc.
- Kraemer & Sons, Inc.
- League of Minnesota Cities
- Meridian Aggregates Company
- Metropolitan Council
- Minnesota Asphalt Pavement Association
- Minnesota Association of Townships
- Minnesota Department of Natural Resources
- Minnesota Department of Transportation
- Minnesota Geological Survey
- The Nature Conservancy
- Tiller Corporation
- Ulland Brothers, Inc.

o Aggregate Resources Task Force

During the 1999 legislative session, the Minnesota Legislature passed a bill creating a twelve member task force to examine issues related to aggregate resources. The content of the legislation is found in *Laws of Minnesota 1998, chapter 401, section 50* - reprinted on the back of this page.

AGGREGATE RESOURCES TASK FORCE.

Subdivision 1. [CREATION; MEMBERSHIP.] (a) An aggregate resources task force consists of 12 members appointed as follows:

(1) the subcommittee on subcommittees of the senate committee on rules and administration shall appoint one citizen member with experience in the state's aggregates industry, one citizen member who is an employee of a local government unit that works with environmental and land use impacts from aggregate mining, and four members of the senate, two of whom must be members of the minority caucus; and

(2) the speaker of the house shall appoint one citizen member who is an employee of a local governmental unit that works with environmental and land use impacts from aggregate mining, one citizen member with experience in native prairie conservation, and four members of the house, two of whom must be members of the minority caucus.

(b) The appointing authorities must make their respective appointments not later than July 1, 1998.

(c) The first meeting of the task force must be convened by a person designated by the chair of the senate committee on rules and administration. Task force members shall then elect a permanent chair from among the task force members.

Subd. 2. [DUTIES.] The task force shall examine current and projected issues concerning the need for and use of the state's aggregate resources. The task force shall seek input from the aggregate industry, state agencies, counties, local units of government, environmental organizations, and other interested parties on aggregate resource issues, including resource inventory, resource depletion, mining practices, nuisance problems, safety, competing land uses and land use planning, native prairie conservation, environmental review, local permit requirements, reclamation, recycling, transportation of aggregates, and the aggregate material tax.

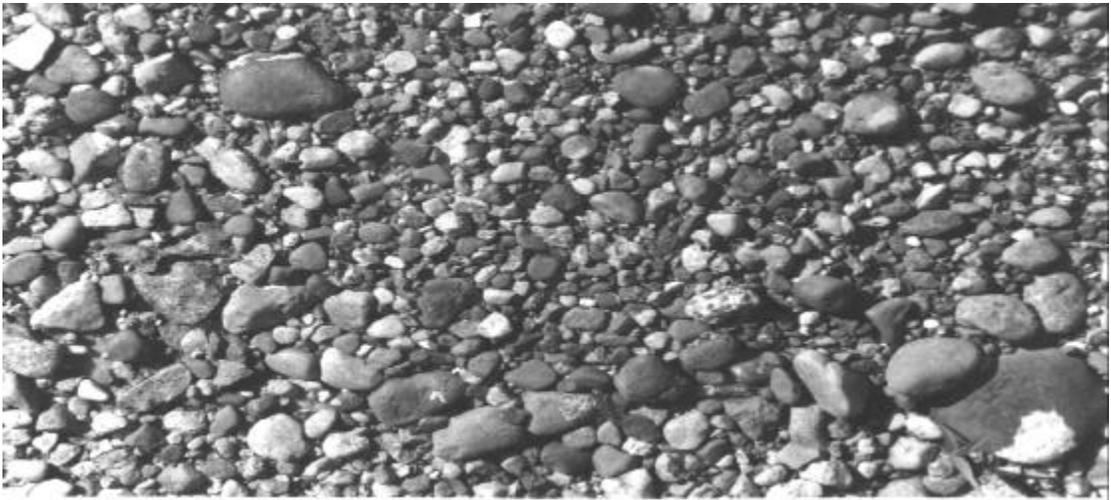
Subd. 3. [REPORT.] Not later than February 1, 2000, the task force shall report to the legislature on the findings of its study. The report must include a recommendation as to whether there is a need for a comprehensive statewide policy on any aggregate resource issue. If the task force recommends a statewide policy, the report must include recommendations on the framework for the statewide policy.

Subd. 4. [EXPIRATION.] The aggregate resources task force expires 45 days after its report and recommendations are delivered to the legislature, or on June 30, 2001, whichever date is earlier.

WHAT IS AGGREGATE?

◦ **Sand, gravel, and crushed rock mixtures**

Aggregate is a broad term used to describe sand, gravel, and crushed rock mixtures. These materials can be further crushed, washed, and blended to meet specifications. Aggregate materials are the basic ingredients for a variety of construction products. Aggregate materials are known by other names including “aggregate”, “construction aggregates”, “sand & gravel”, “crushed rock”, and “construction sand & gravel”.



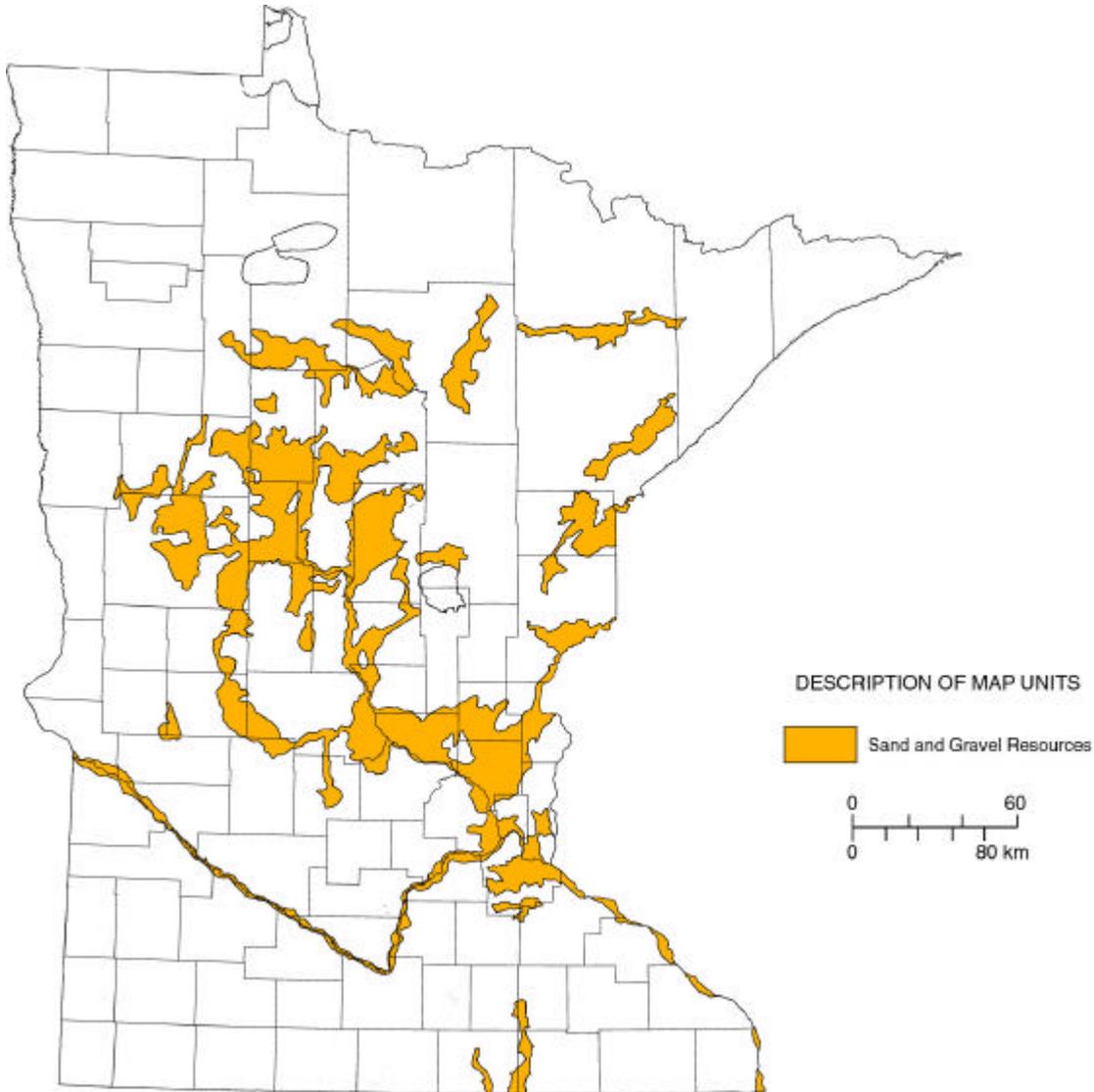
◦ **Three materials mined**

Minnesota’s aggregate industry mines three types of materials.

1. Sand and gravel mined from glacial or alluvial deposits - this material represents the majority of aggregate production and is sometimes referred to as “natural” aggregate.
2. Crushed carbonate rock mined from bedrock in southeastern Minnesota and in the metropolitan area.
3. Crushed rock mined from granite, quartzite, or trap rock elsewhere in the state.

In addition to aggregate deposits that are mined, “recycled aggregate” can be made from demolition material that is crushed and cleaned of impurities.

Major areas of surface sand and gravel in Minnesota.



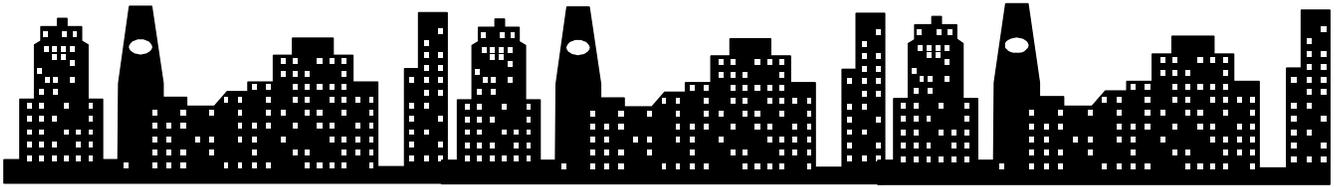
Source: Minnesota Geological Survey

Only a small fraction of the area depicted contains gravel of economic quantity and grade. Many local deposits that are too small to depict individually on this map occur throughout the state.

WHY ARE AGGREGATE RESOURCES IMPORTANT?

◦ Every citizen consumes aggregate

Although few people realize it, every person living in Minnesota consumes about 58 pounds of aggregate per day without even knowing it. This figure, roughly equivalent to 10.5 tons per person per year, is the amount of aggregate material needed annually to maintain and construct roads, develop infrastructure, support building and construction projects, and for use in industrial applications.



◦ Aggregate mining contributes to economy

Aggregate mining contributes significantly to the state economy. In 1997, more than 51,000,000 short tons of aggregate were mined in Minnesota at a value that exceeded \$187,000,000. Industry trade associations estimate 1,200 operators generate 10,000 jobs.

Aggregate demand is closely tied to economic indicators. As such, the aggregate industry is subject to cyclic swings in demand. Because of the vigorous economy in Minnesota, growth in the aggregate industry has been approximately 2 to 3% annually.

Minnesota's Aggregate Profile

51,000,000 tons aggregate
produced in 1997

4,000 gravel pits & 1,500 rock
quarries

1,200 producers

10,000 employees

- Production figures for 1997 compiled by the United States Geological Survey (USGS) indicate that Minnesota ranks 5th nationally in construction sand and gravel with production of 38.0 million short tons at a value of \$125 million.
- Production figures for 1997 compiled by the USGS indicate that Minnesota ranks 27th nationally in crushed stone with production of 13.2 million short tons at a value of \$61.4 million.

MINNESOTA AGGREGATE PRODUCTION

1980 - 1997

YEAR	PRODUCTION Sand & Gravel (million short tons)	PRODUCTION Crushed Rock (million short tons)	TOTAL PRODUCTION Sand & Gravel + Crushed Rock (million short tons)	TOTAL VALUE Sand & Gravel + Crushed Rock (\$ million)
1980	25.1	8.6	33.7	71
1985	25.0	9.0	34.0	85
1990	33.9	9.1	43.0	109
1995	35.1	12.5	47.6	147
1996	35.0	13.3	48.3	166
1997	38.0	13.2	51.2	187

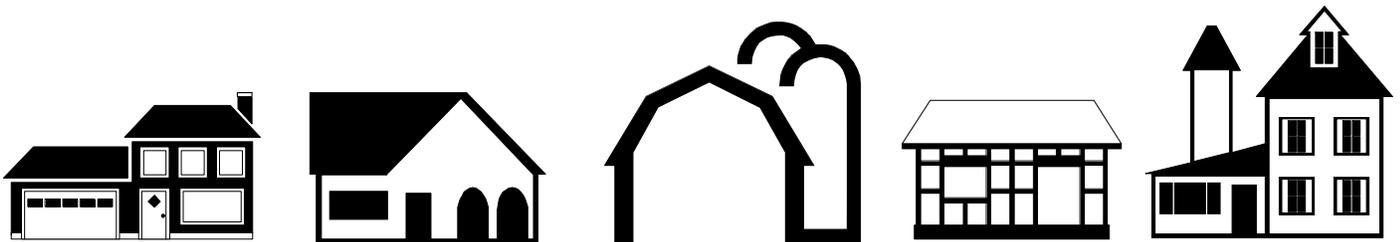
Source: USGS Mineral Industry Surveys, Minnesota, August 1998 and personal communication with USGS staff Wallace Bolen, November 1998.

WHO USES AGGREGATE?

○ Aggregate used as a raw material

Aggregate is an essential raw material used by a number of related industries to produce higher value products. Below are the major users of aggregate materials.

- asphalt pavement and concrete industry
- ready mixed concrete industry
- precast concrete products industry
- building contractors
- homeowners
- state and local government
- agriculture



Some Startling Facts.....

10.5 tons of aggregate consumed per person per year

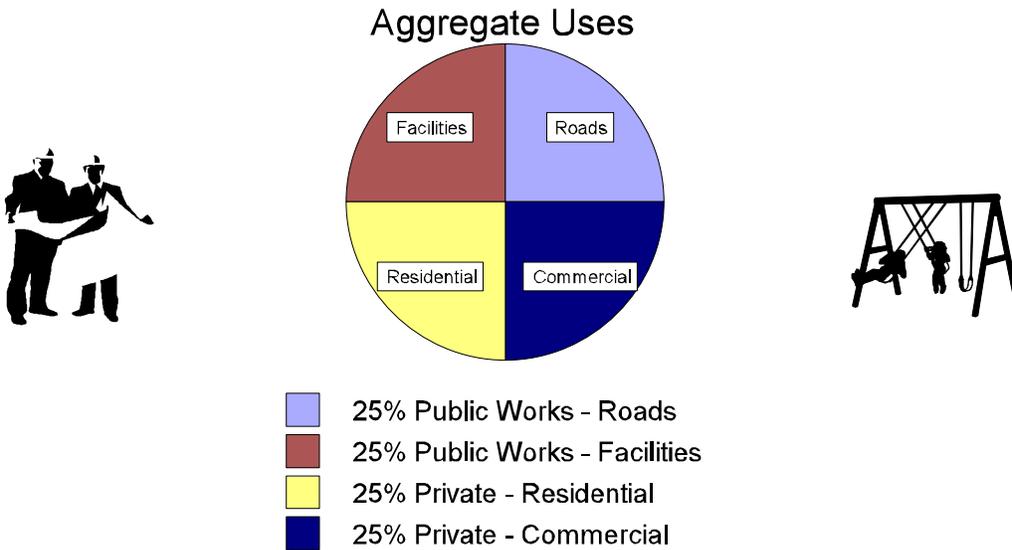
A new home requires about 120 tons of aggregate materials

1 mile of four lane highway uses about 20,000 tons of aggregate



o Aggregate used by private and public sectors

About 50% of the total amount of the aggregate consumed each year in Minnesota is used for public works projects with the remaining 50% used in the private sector. The pie chart illustrates how aggregate is used in the private and public sectors.



Source: Aggregate Industry

- About 25% of the total aggregate consumed in a year is used for construction or maintenance of the state's 133,000 miles of public roads.
- About 25% is used for public works projects like dams, airports, and public buildings.
- About 25% is used for private residential construction.
- About 25% is used for commercial building projects and industrial applications like concrete, asphalt, railroad ballast, and agricultural lime among many others.

◦ **Aggregate used in roads**

Minnesota is the 12th largest state in the U.S. and covers 53.8 million acres including 2.6 million acres of water. The state contains a vast network of roads and infrastructure. One of the most highly visible uses for aggregate materials is in road construction and maintenance. Road construction accounts for about 25% of the aggregate used in Minnesota in any given year.

- There are more than 133,000 miles of roads in Minnesota. This figure does not include recreational trails or forest roads. The Minnesota Department of Transportation (Mn/DOT) uses about 5 million tons of aggregate annually for pavement structures including bituminous, concrete, shoulders, base course and surfacing course. About 90% of the weight in roads is due to aggregate.
- Mn/DOT estimates that approximately \$2.4 billion of federal, state, and local funds will be invested in transportation projects for fiscal years 1998 - 2000. Such an expenditure for road construction will require large amounts of aggregate materials.

Bituminous roadway under construction



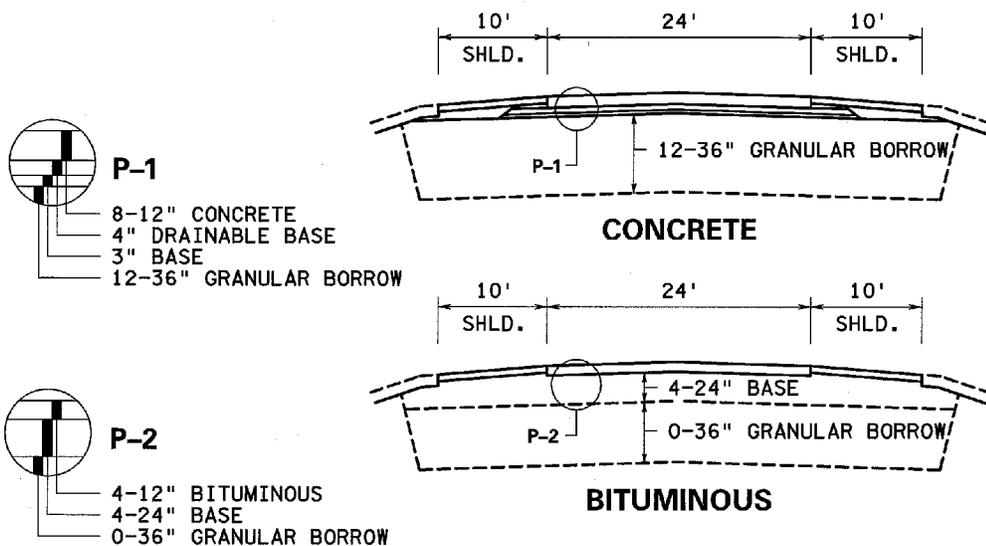
Source: Minnesota Department of Transportation

MINNESOTA ROAD SYSTEMS

ROAD SYSTEM	MILES	% OF TOTAL ROADS
Trunk Highway	12,000	9.0%
County State Aid	30,000	22.5%
Municipal State Aid	2,500	1.9%
County	15,000	11.2%
Municipal Streets	15,000	11.2%
Township Roads	59,000	44.2%
GRAND TOTAL	133,500	100.0%

Source: Minnesota Department of Transportation

TYPICAL ROADWAY SECTIONS



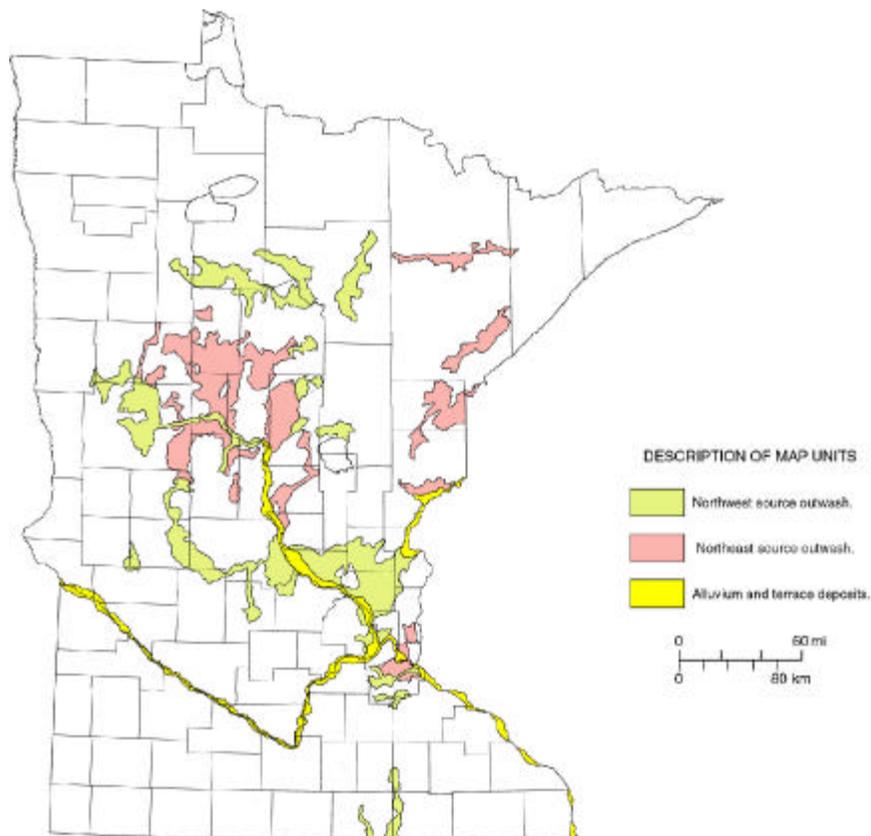
Source: Minnesota Department of Transportation

WHERE IS AGGREGATE FOUND?

○ Aggregate resources vary in distribution

Aggregate resources are not uniformly distributed around the state. The location of aggregate deposits depends on past geologic processes. Human needs and desires have no bearing on where aggregate resources are found. As a consequence, economically viable deposits of sand, gravel, and stone appropriate for crushing are in fixed locations, whether convenient or not. Because of the uneven distribution of these resources, some communities are exporters and others are importers of aggregate materials.

In general, the best gravel deposits are found in areas of outwash associated with glaciers that advanced into Minnesota from the northeast (red on map). Gravels within northwest-source outwash (green), contain particles of shale and shaly limestone that make them unsuitable for use in high quality concrete and asphalt. Terrace deposits (yellow) along major rivers generally contain quality gravel.



Source: Minnesota Geological Survey

o **Aggregate mined in all 87 counties**

Although aggregate resources are scattered throughout the state, some counties have a greater supply and a higher quality of aggregate than others. Over the years, some type of aggregate material has been or is currently being mined in all of the state's eighty-seven counties. Typically, crushed carbonate rock is the primary source of aggregate in the southeastern part of the state. Granitic bedrock is quarried and crushed in the Minnesota River Valley and the St. Cloud area. Some areas of the state have essentially no aggregate such as portions of the Red River Valley and the peatlands in northern Minnesota.



At present time, the closest approximation to a statewide inventory of known aggregate deposits is a Mn/DOT data base known as ASIS (Aggregate Source Information System). ASIS is used to identify potential sources of aggregate for road projects. Based on ASIS data and informal surveys with county engineers, there are an estimated 4,000 gravel pits and 1,500 rock quarries in Minnesota (see ASIS map on facing page). Only a portion of these 5,500 sites are active in any given year. This estimate includes pits and quarries in various stages of mining including active operations, temporarily inactive sites, abandoned pits that have not been reclaimed, and reclaimed sites.

o **Aggregate inventories**

The Aggregate Planning and Protection Act was enacted in 1984 as Minnesota Statute 84.94. The purpose of the act is to protect aggregate resources; to promote

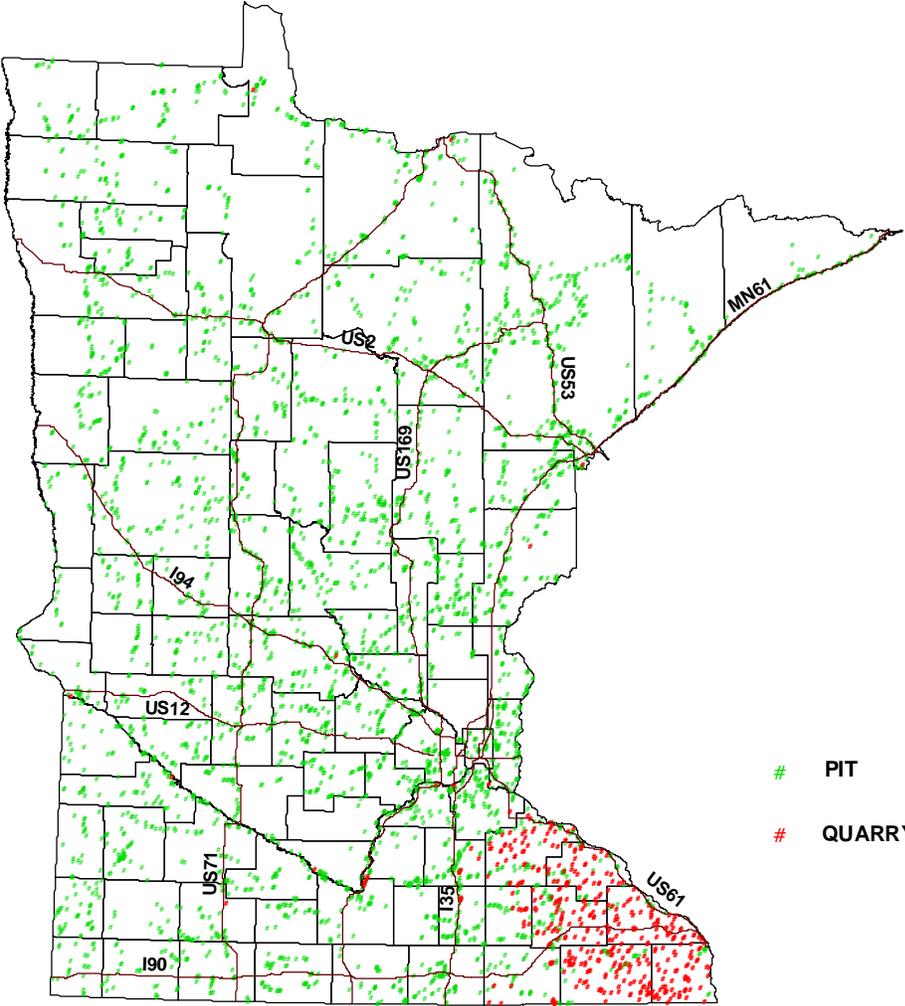


orderly and environmentally sound development; and to introduce aggregate resource protection into local comprehensive planning and land use controls. It calls for the identification and classification of aggregate deposits and requires local planning authorities to consider that information in local planning.

The Act gives the responsibility for identifying and mapping aggregate deposits to the Metropolitan Council for the seven-county metropolitan area, and to the Department of Natural Resources (DNR) for the other eighty counties in the state. There is no specific funding for the program.

Statewide ASIS Database

AGGREGATE SOURCES

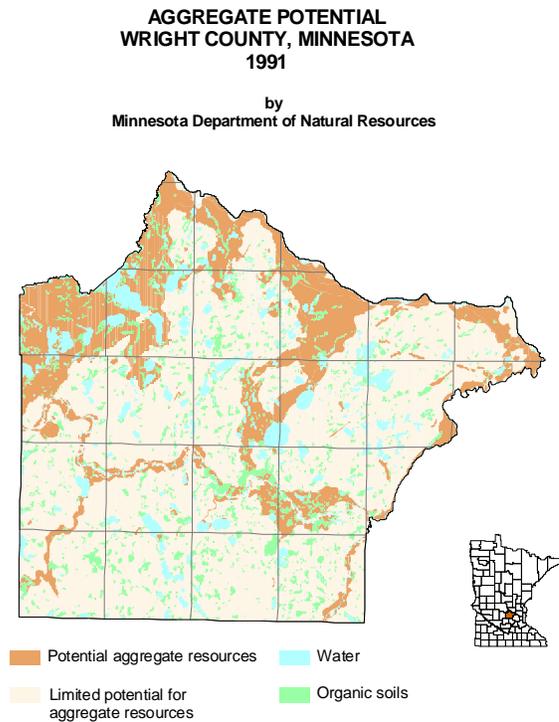


Data from Minnesota Department of Transportation, Aggregate Unit Files

MnDOT, Aggregate Unit, 10/30/98

The first metropolitan area aggregate inventory was conducted and published in the early 1980's by the Metropolitan Council. The aggregate reserves identified by that report did not consider land use patterns that preclude mining nor did it contemplate the unanticipated rapid growth in the metropolitan area that has occurred. An update is now in progress under a cooperative agreement between the Minnesota Geological Survey (MGS) and the Metropolitan Council. Anticipated completion date is 1999.

Four non-metro counties (Wright, Sherburne, Isanti, Clay) have been inventoried since 1984 by DNR under the Aggregate Mapping Program. This program identifies where aggregate deposits that may be used in the future are located, and what the general quality parameters are. The aggregate inventory can provide communities and local governments with important information needed to plan for the future. At the present rate of progress, the remaining counties will not be fully inventoried for many years. Blue Earth County is currently being mapped using computer technology. Below is an simplified view of the aggregate potential map prepared for Wright County.



An example of a county aggregate survey prepared as required by Minnesota Statutes, section 84.94, Aggregate Planning and Protection.

WHAT MAKES GOOD AGGREGATE?

Technical and Economic Factors

○ Aggregate quality varies

By far the largest tonnage of aggregate is used as construction materials for engineered works like concrete, asphalt concrete, road base, railroad ballast, and fill. Aggregate materials in the size range appropriate for these uses are more valuable, on the average, than materials coarser or finer. In any natural deposit of gravel and sand, most of the economic value is in the gravel. Much of the material within the large glacial outwash plains of Minnesota is of limited potential for aggregate mining because the ratio of gravel to sand is too low. The physical and chemical attributes of aggregates also influence their value.

○ Specifications vary for different uses

The variable quality of natural aggregate deposits relates to the nature of the local rocks or regional bedrock that became the pebbles in the deposit. If the pebbles are composed of rock types that are strong, durable, and chemically non-reactive, the gravel will be of high quality. However, it only takes a small percentage of poor quality pebble types to lower the rating for the entire deposit.

For example, in western Minnesota, many gravel deposits contain shale that glaciers carried here from Manitoba. This shale is of such poor quality that it is deleterious to concrete and bituminous. There are strict limits or specifications as to the amount of deleterious materials like shale that can be tolerated in aggregate used in the manufacture of concrete and bituminous. Due to presence of deleterious materials, many deposits are unsuitable for state highways. There are numerous examples of quality specifications that apply to aggregate. The overall result is that some deposits are not suitable for certain end uses.



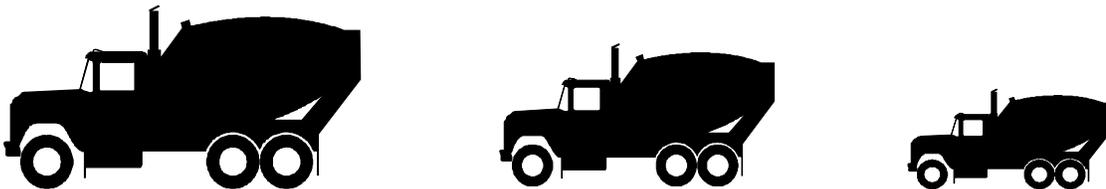
Cracked concrete Source: Mn/DOT

◦ High transportation costs

In general, aggregate materials are typically low value, high volume commodities whose delivered price is highly dependent on haul distance. Due to its weight, aggregate cannot be economically transported long distances. Consumers of construction aggregates statewide depend on the continued availability of relatively low cost, quality aggregates produced in proximity to where it is used.

When aggregate must be transported farther to reach the consumer, the total cost of the aggregate rises rapidly. The aggregate industry reports that the cost of aggregate increases 100% at a trucking distance of approximately 20 to 30 miles. Large semi-trailer truck transport costs approximately 10 to 15 cents per mile per ton of aggregate. Greater haul distances affect not only the price of the aggregate but also impact the environment.

Sustained truck traffic can damage roads. The Aggregate Material Tax (Minnesota Statute 298.75) was enacted in 1960 to generate a source of funds to repair damage to local roads caused by hauling aggregate, especially in areas where gravel was being exported to another county or state. A later section in this report (entitled existing legislation) provides more information on this statute.



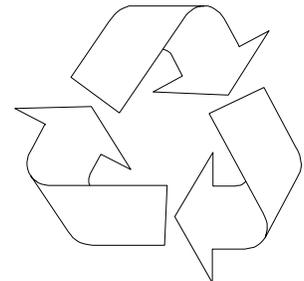
○ **Factors in development of aggregate deposits**

When a resource has been identified, other factors like market demand and haul distance determine whether a deposit can serve as an economic source of aggregate materials. Identified deposits will only become economic sources of aggregate when several conditions are met including:

- a market need for aggregate material,
- an owner willing to sell or lease the deposit,
- a willing developer and/or mining company,
- permit approvals,
- an ample quantity of aggregate,
- appropriate aggregate quality for the intended market,
- a cost effective mining plan, and
- reasonable transportation costs.

○ **Aggregate recycling**

Aggregate resources are non-renewable and finite resources that are only partially recoverable through recycling. Recycled aggregate is made from demolition material that is crushed, cleaned of impurities and then sold for a variety of uses, mostly as fill or road base. There is often a greater market demand for recycled aggregate than supply. Recycled aggregate depends on a supply of clean demolition material which is frequently limited. With demand for recycled aggregate so great, almost all available demolition material is currently recycled by the aggregate industry.



Aggregate recycling can extend gravel resources and minimize the need to open new mining sites. It is important to recognize, however, that the supply of recycled aggregate is limited and that recycled aggregate can not meet certain product specifications. There will always be a need for new aggregate sources.

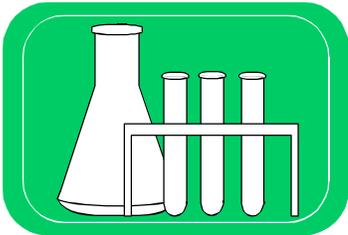
C Close to 3 million tons of recycled aggregate are used each year in the metropolitan area, which is approximately 10% of the total aggregate production.

◦ **Changing specifications, new products, new uses**

The aggregate industry is a growing and dynamic industry. Advances in technology within the industry have led to changing specifications, new products, and new uses for waste materials.

New products, such as high strength and high performance concrete used for bridges, roads, and buildings, and “superpave” used for bituminous roads have been introduced into the market. Superpave specifications for bituminous roadways tighten the tolerance of acceptable aggregate material. The tightened quality specifications have limited the number of potential aggregate sources. New concrete specifications for sand have also limited sources, or made processing costs higher.

Innovative uses of materials formerly considered waste are being investigated. Crushed glass, shingles, fly ash, and other recycled waste materials have been and will continue to be used in roads and other structures on an experimental basis. New computerized equipment, which can track, sort, and tabulate material enters the market each year. There is also equipment available which can improve some quality attributes of an aggregate source, such as decrease its shale content.



THE CURRENT OUTLOOK

◦ **Available aggregate sources are declining**

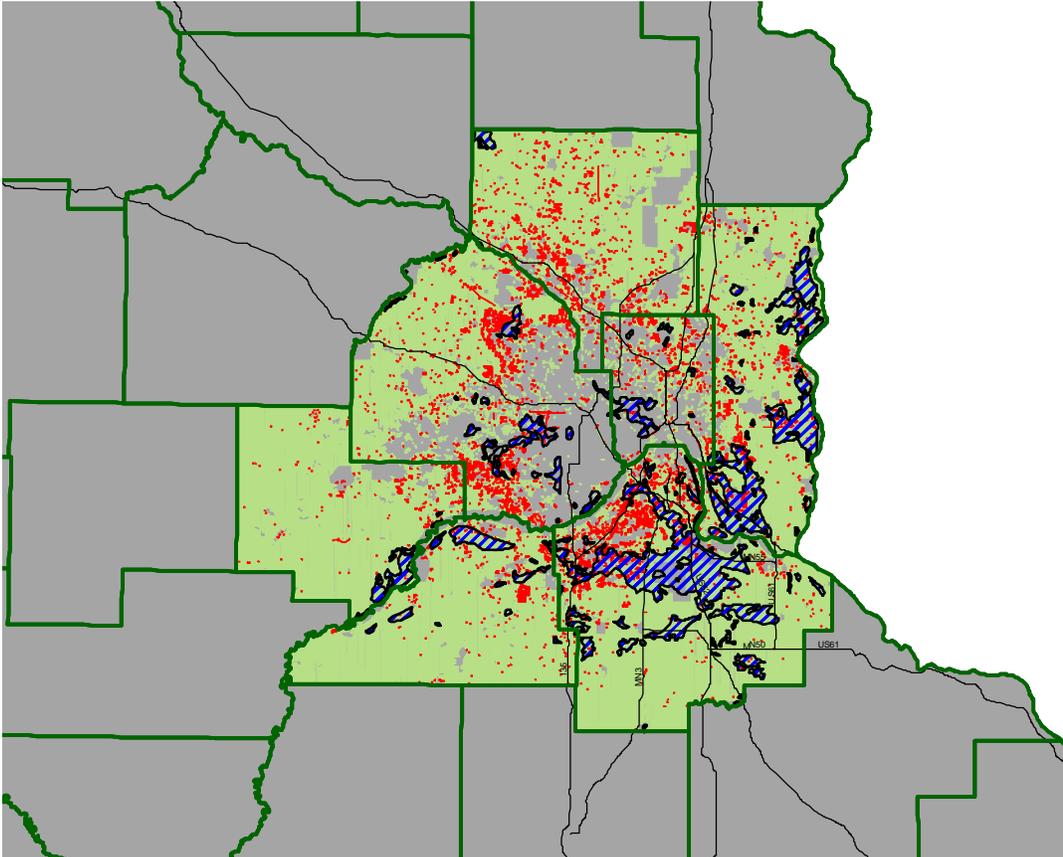
Aggregate materials are a finite natural resource. Although once plentiful, aggregate sources are diminishing around the state from resource depletion as well as land uses that prohibit mining. Heightened quality specifications further limit the available supply. Adding to the problem is an increasing demand for aggregate materials that is directly proportional to the state's expanding population.

In the metropolitan area, these issues were apparent in the 1980's. In a 1983 study, the Metropolitan Council published a projection of long-term construction aggregate demand and resource supply. Subsequently in 1984, legislation was enacted to initiate county-level aggregate planning and protection (Minn. Stat. 84.94). However, little has been accomplished in regard to either planning or resource protection. Today, in the metropolitan area, the aggregate industry estimates that there is less than a 15-year resource supply that is currently permitted for extraction (see Aggregate Resources vs. Land Use Map

In the intervening years since the Metropolitan Council study, population growth and sprawl have surpassed projections intensifying the concerns addressed over a decade ago. Increased consumption, competing land uses, zoning restrictions and strict aggregate quality specifications have reduced the availability of low cost construction aggregates not only in the metropolitan area but also in many other areas of the state.

Population growth near regional centers such as Rochester, St. Cloud, Duluth, Mankato, and Moorhead is a driving force for increased aggregate demand. In areas of population growth, aggregate mining can be an unwelcome neighbor. Important aggregate sources are often lost because the location and value of the resource was not recognized prior to building roads and other structures that cover the deposit. In other locations, for example on the North Shore, Cook and Lake counties are now dealing with an aggregate resource scarcity.

Potential Sand & Gravel Resources vs. Land Use (Metro Area)



**Sand and Gravel
Potential Resources -
Category I**



Vacant/Agricultural Land 1990



**Vacant/Agricultural Land 1984 -
Developed Land -1990**



Developed / Unavailable

S

City

Notes

Category I sand and gravel: More than 35% gravel; more than 10-ft thick; 0 to 10-ft of cover; water table deeper than 20-ft below land surface; good to limited subsurface data.

Sand and gravel potential resources data obtained from Minnesota Geological Survey, Information Circular 20, Aggregate Resources Inventory, Twin Cities Metropolitan Area. Land use data obtained from Metropolitan Council, Generalized Land Use Layer.

This data intended only for discussion.
This is not an official release and should be used with suitable caveats.

Increasingly, aggregate resources are identified on undeveloped lands that also provide habitat for declining plant communities or rare plants and animals. Examples include the beach ridges in the Red River Valley that support both gravel mining and native prairie. The pressure on undeveloped lands can be extreme. Public desires to preserve undeveloped lands for recreation or conservation purposes can pose another conflict with aggregate mining.

◦ **Permit requirements vary among local jurisdictions**

Historically in Minnesota, regulation of aggregate mining has been the responsibility of local government. Each locality designs its own permit and standards to meet local needs. This has inevitably led to differences in the ways in which local jurisdictions permit aggregate mining.

At present, the most extensive review of aggregate mining operations takes place at the local unit of government - county, township or municipality. In Minnesota, there are 87 counties, 1,802 townships, and 855 cities. Each of these entities has the authority to regulate aggregate mining through zoning ordinances and land use planning. Operating concerns such as view, noise, dust, hours of operations, traffic and final reclamation are often addressed in local permits.

Environmental review in the form of a mandatory Environmental Assessment Worksheet (EAW) is required when a gravel mining operation is expected to exceed 40 acres in size to a mean depth of 10 feet. Environmental Impact Statements (EIS) are mandatory for operations exceeding 160 acres. The Responsible Governmental Unit for environmental review is local government.

◦ **State or federal permits that apply**

State and federal environmental requirements may also apply to aggregate mining operations. State permits from the DNR may be required for some mining operations if there is a need to appropriate water. Permits from the Minnesota Pollution Control Agency (MPCA) may be required for storm water discharge, water quality concerns, air emissions, and above ground storage tanks. The U. S. Army Corps of Engineers may require a permit for operations within wetlands or water courses. Wetland mitigation as required under the Wetlands Conservation Act of 1991 may also be necessary if wetlands are impacted by the operation. In addition, safety regulations administered under OSHA and MSHA may apply.

State and federal permits that may apply to aggregate mining are listed below.

Minnesota Pollution Control Agency

- Fuel and Hazardous Materials (liquid storage tanks)
- Air Emissions Permit
- Solid Waste Management (storage of used asphalt and/or concrete, captured particulate emissions, or other demolition)
- Water Quality Management (storm water runoff and discharge)

Minnesota Department of Natural Resources

- Water Appropriation Permit (appropriations of more than 10,000 gallons/day or one million gallons/year)

U.S. Army Corps of Engineers

- Section 404 Permit (discharge of dredged or fill material or excavate within waters or wetlands)

◦ Reclamation

In the past, reclamation of aggregate mining areas has not been a major environmental concern. Today, aggregate mining is increasingly viewed as a temporary use to be followed by another land use that is compatible with the surrounding landscape. Like many other industries, the environmental standards have increased for aggregate mining. In the past, former mining areas were operated and abandoned in a manner that is no longer acceptable. Today, the public often expects that aggregate mining areas will be reclaimed to an appropriate end use. The demand for technical information on reclamation and funding sources is growing.

Examples are found throughout the state of depleted gravel pits that have been successfully reclaimed to agricultural or forestry uses, fish & wildlife habitat, recreation areas, or urban building sites. In some cases, reclamation has been so successful that the pits are no longer recognizable as former mining areas, such as the Centennial Lakes complex in Edina. Other pits can be found where natural revegetation has successfully occurred unassisted.

However, the problems associated with some unreclaimed pits can be substantial. Some pits are a threat to public safety due to dangerous vertical pit walls or deep water. Others are a concern because of erosion and possible pollution of downstream receiving waters. Still other pits become arenas for off-road vehicle use, illegal dumping, trespass, and unauthorized target shooting and parties. For troublesome pits that are the scene of reoccurring misuse, the only reasonable and permanent solution may be reclamation.

Currently, there is no state or federal mining permit in Minnesota that requires aggregate operations to be reclaimed. Reclamation terms are most often addressed in the local permit or through leasing agreements between landowners and mining companies.

To address reclamation, some local permits now require the preparation of a mining plan. The purpose of a mining plan is to ensure that mining will proceed in an environmentally sound manner and that the area will be left in a safe, nonpolluting condition that has some future land value. A mining plan may also address view, hours, noise, dust, and traffic.

◦ **Existing legislative framework**

Although many laws and statutes apply generally to the aggregate mining industry, there are two state statutes that specifically address aggregate:

1) Aggregate Protection and Planning Act and 2) Aggregate Materials Act. Both statutes have been referred to earlier in this report and are summarized here. The complete statutes are found in Appendix A and B, respectively.

Aggregate Protection and Planning Minnesota Statute 84.94

This statute was enacted in 1984. The purpose of the act is to “protect aggregate resources; to promote orderly and environmentally sound development; and to introduce aggregate resource protection into local comprehensive planning and land use controls”. The statute calls for the identification and classification of aggregate deposits and requires local planning authorities to consider the information. Four counties have been mapped since the program began: Sherburne, Wright, Isanti and Clay. Blue Earth County is in progress. A revised aggregate inventory for the metropolitan area is also under development.

Aggregate Material Tax Minnesota Statute 298.75

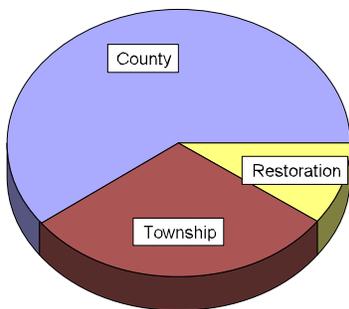
The Aggregate Material Tax is a production tax on the removal of aggregate material. Clay County in the Red River Valley was the first county to collect the tax. The statute was later amended to include other counties in the Red River Valley, St. Cloud vicinity, and the metropolitan area. In recent years, more counties have been added. There are now 28 counties authorized to collect the tax. Of those, 23 counties imposed the tax in 1997 and 5 counties did not exercise their authority to collect the tax. In 1997, a total of \$2,658,567 was collected by the 23 counties imposing the tax. The counties authorized to collect the tax are:

Pope, Stearns, Benton, Sherburne, Carver, Scott, Dakota, Le Sueur, Kittson, Marshall, Pennington, Red Lake, Polk, Norman, Mahnomen, Clay, Becker, Carlton, St. Louis, Rock, Murray, Wilkin, Big Stone, Sibley, Hennepin, Washington, Chisago, and Ramsey.

The tax imposed on operators is ten cents per cubic yard or seven cents per short ton. According to statute, the tax is distributed as follows:

- 60% to the county road and bridge fund
- 30% to the township or city road and bridge fund
- 10% to a reserve fund for pit restoration of abandoned pits or quarries on public and tax forfeited lands.

Distribution of Aggregate Tax



- 60% County Road & Bridge
- 30% Township Road & Bridge
- 10% Restoration Fund for Public Pits

This statute has been amended several times in recent years. The following statistics are collected every year by the Minnesota Department of Revenue, Minerals Tax Office and published in an annual report.

AGGREGATE TAX COLLECTED

1981	\$ 104,693	1990	\$ 1,939,276
1982	236,039	1991	1,783,301
1983	1,503,599	1992	1,895,260
1984	1,731,600	1993	2,045,794
1985	1,783,940	1994	2,272,272
1986	1,938,702	1995	2,114,823
1987	2,115,649	1996	2,330,664
1988	1,830,535	1997	2,658,567
1989	2,003,391	1998	

Source: Minnesota Department of Revenue, Minerals Tax Office, 1998

AGGREGATE TAX COLLECTED BY COUNTY - 1997

Becker	\$ 93,673	Pennington	\$ 14,170
Benton	0	Polk	3,326
Big Stone	81,228	Pope	0
Carver	63,203	Ramsey	42,045
Clay	183,414	Red Lake	34,853
Dakota	575,393	Scott	285,275
Hennepin	357,327	Sherburne	185,913
Kittson	34,332	Sibley	37,185
LeSueur	180,184	Stearns	59,566
Mahnomen	3,212	Washington	389,986
Marshall	1,914	Wilkin	19,331
Norman	13,037	TOTAL	\$2,658,567

Source: Minnesota Department of Revenue, Minerals Tax Office, 1998

◦ **Varied roles of government agencies and committees**

In addition to permitting responsibilities, certain federal, state and local governmental agencies have specific functions and responsibilities relative to the aggregate industry as noted.

- United States Geological Survey - conducts mineral industry production surveys (former function of U.S. Bureau of Mines).
- Minnesota Geological Survey - maps surficial and bedrock geology, cooperative project underway to update Metropolitan Area aggregate inventory.
- Minnesota Department of Natural Resources, Minerals Division - aggregate mapping program under Minn. Stat. 84.94, Blue Earth County in progress.
- Minnesota Department of Transportation - Aggregate Materials Laboratory, ASIS database, largest single consumer of aggregate.
- Minnesota Department of Revenue, Minerals Tax Office - collects statistics on Aggregate Material Tax (Minn. Stat. 298.75).
- Metropolitan Council - cooperative project underway to update Metropolitan Area aggregate inventory.
- Governor's Task Force on Minerals - aggregate recommendations contained in 1996 and 1997 reports.
- Minerals Coordinating Committee - 1998 legislation added an industrial minerals representative to committee.
- local government - permitting, responsible governmental unit for environmental review.

THE FUTURE OUTLOOK

With the projected population of Minnesota in the year 2000 at 4.8 million and rising at a constant 48,000 per year, the issues relating to aggregate will reach a critical point in the immediate future. As resource availability becomes more restricted and costs rise, aggregate mining will likely become more acrimonious.

The Governor's Task Force on Minerals recommended in their 1997 report to the Governor that an Aggregate Resources Task Force be established to examine issues related to construction aggregates. These are the key points:

- Minnesota's population will reach 4.8 million by the year 2000. Expanding population is driving an increase in consumption of aggregate materials.
- Aggregate is vital to the state's infrastructure. Aggregate consumption is tied to a high standard of living and quality of life.
- The growth in the aggregate industry, roughly 2 to 3 % annually, reflects the state's vigorous economy.
- Aggregate materials are a finite natural resource. Although once plentiful, aggregate sources are diminishing around the state from resource depletion as well as land uses that prohibit mining. Aggregate shortages are already occurring in some locations.
- Aggregate inventories are lacking in critical areas of the state. More effort is needed to identify aggregate resources before development occurs that precludes mining, to conserve known aggregate deposits, and to mine aggregate prior to development whenever possible.
- In populated areas, gravel mining is often an unwelcome neighbor. Conflicts between aggregate mining and other land uses are escalating.
- Public desire to preserve undeveloped lands for recreation or conservation purposes also poses a conflict with aggregate mining.

- The standards for reclamation after mining are variable. Many companies support good reclamation practices but some do not.
- Technical expertise to guide aggregate mining is sometimes not available in local units of government.
- The need to rebuild and repair aging infrastructure around the state such as bridges, airports, and roads is growing. Fulfilling this need will require large volumes of aggregate.
- The need for new infrastructure in growth corridors such as the suburbs surrounding the metropolitan area, Rochester, and St. Cloud as well as growth centers like Duluth, Moorhead, and Mankato among others is great. Fulfilling this need will require large volumes of aggregate.
- A record breaking transportation bonding bill was passed by the 1998 congress. Total government investment in the state's transportation infrastructure is expected to approach \$2.4 billion for the years 1997 to 1999. Such an investment will require large volumes of aggregate.
- Hauling aggregate greater distances to customers is costly. A city of 100,000 can expect to pay an additional \$1.3 million for the aggregate it uses in a year for each increase of 10 miles in haul distance.

APPENDIX A

Aggregate Planning and Protection Minnesota Statute 84.94

84.94 Aggregate planning and protection.

Subdivision 1. Purpose. It is the purpose of this section to protect aggregate resources; to promote orderly and environmentally sound development; to spread the burden of development; and to introduce aggregate resource protection into local comprehensive planning and land use controls.

Subd. 2. Definition. For the purpose of this section, "municipality" means a home rule charter or statutory city, or a town.

Subd. 3. Identification and classification. The department of natural resources, with the cooperation of the state geological survey, departments of transportation, and energy, planning and development, outside of the metropolitan area as defined in section 473.121, shall conduct a program of identification and classification of potentially valuable publicly or privately owned aggregate lands located outside of urban or developed areas where aggregate mining is restricted, without consideration of their present land use. The program shall give priority to identification and classification in areas of the state where urbanization or other factors are or may be resulting in a loss of aggregate resources to development. Lands shall be classified as:

(1) identified resources, being those containing significant aggregate deposits;

(2) potential resources, being those containing potentially significant deposits and meriting further evaluation; or

(3) subeconomic resources, being those containing no significant deposits.

As lands are classified, the information on the classification shall be transmitted to each of the departments and agencies named in this subdivision, to the planning authority of the appropriate county and municipality, and to the appropriate county engineer. The county planning authority shall notify owners of land classified under this subdivision by publication in a newspaper of general circulation in the county or by mail.

Subd. 4. Local action. Each planning authority of a county or municipality receiving information pursuant to subdivision 3 shall consider the protection of identified and important aggregate resources in their land use decisions.

HIST: 1984 c 605 s 1

APPENDIX B

Aggregate Material Tax Minnesota Statute 275.98

298.75 Aggregate material removal; production tax.

Subdivision 1. Definitions. Except as may otherwise be provided, the following words, when used in this section, shall have the meanings herein ascribed to them.

(1) "Aggregate material" shall mean nonmetallic natural mineral aggregate including, but not limited to sand, silica sand, gravel, building stone, crushed rock, limestone, and granite. Aggregate material shall not include dimension stone and dimension granite. Aggregate material must be measured or weighed after it has been extracted from the pit, quarry, or deposit.

(2) "Person" shall mean any individual, firm, partnership, corporation, organization, trustee, association, or other entity.

(3) "Operator" shall mean any person engaged in the business of removing aggregate material from the surface or subsurface of the soil, for the purpose of sale, either directly or indirectly, through the use of the aggregate material in a marketable product or service.

(4) "Extraction site" shall mean a pit, quarry, or deposit containing aggregate material and any contiguous property to the pit, quarry, or deposit which is used by the operator for stockpiling the aggregate material.

(5) "Importer" shall mean any person who buys aggregate material produced from a county not listed in paragraph (6) or another state and causes the aggregate material to be imported into a county in this state which imposes a tax on aggregate material.

(6) "County" shall mean the counties of Pope, Stearns, Benton, Sherburne, Carver, Scott, Dakota, Le Sueur, Kittson, Marshall, Pennington, Red Lake, Polk, Norman, Mahnommen, Clay,

Becker, Carlton, St. Louis, Rock, Murray, Wilkin, Big Stone, Sibley, Hennepin, Washington, Chisago, and Ramsey.

Subd. 2. A county shall impose upon every importer and operator a production tax equal to ten cents per cubic yard or seven cents per ton of aggregate material removed except that the county board may decide not to impose this tax if it determines that in the previous year operators removed less than 20,000 tons or 14,000 cubic yards of aggregate material from that county. The tax shall be imposed on aggregate material produced in the county when the aggregate material is transported from the extraction site or sold. When aggregate material is stored in a stockpile within the state of Minnesota and a public highway, road or street is not used for transporting the aggregate material, the tax shall be imposed either when the aggregate material is sold, or when it is transported from the stockpile site, or when it is used from the stockpile, whichever occurs first. The tax shall be imposed on an importer when the aggregate material is imported into the county that imposes the tax.

If the aggregate material is transported directly from the extraction site to a waterway, railway, or another mode of transportation other than a highway, road or street, the tax imposed by this section shall be apportioned equally between the county where the aggregate material is extracted and the county to which the aggregate material is originally transported. If that destination is not located in Minnesota, then the county where the aggregate material was extracted shall receive all of the proceeds of the tax.

Subd. 3. By the 14th day following the last day of each calendar quarter, every operator or importer shall make and file with the county auditor of the county in which the aggregate material is removed or imported, a correct report under oath, in such form and containing such information as the auditor shall require relative to the quantity of aggregate material removed or imported during the preceding calendar quarter. The report shall be accompanied by a remittance of the amount of tax due.

If any of the proceeds of the tax is to be apportioned as provided in subdivision 2, the operator or importer shall also include on the report any relevant information concerning the amount of aggregate material transported, the tax and the county of destination. The county auditor shall notify the county

treasurer of the amount of such tax and the county to which it is due. The county treasurer shall remit the tax to the appropriate county within 30 days.

Subd. 4. If the county auditor has not received the report by the 15th day after the last day of each calendar quarter from the operator or importer as required by subdivision 3 or has received an erroneous report, the county auditor shall estimate the amount of tax due and notify the operator or importer by registered mail of the amount of tax so estimated within the next 14 days. An operator or importer may, within 30 days from the date of mailing the notice, and upon payment of the amount of tax determined to be due, file in the office of the county auditor a written statement of objections to the amount of taxes determined to be due. The statement of objections shall be deemed to be a petition within the meaning of chapter 278, and shall be governed by sections 278.02 to 278.13.

Subd. 5. Failure to file the report and submit payment shall result in a penalty of \$5 for each of the first 30 days, beginning on the 15th day after the last day of each calendar quarter, for which the report and payment is due and no statement of objection has been filed as provided in subdivision 4, and a penalty of \$10 for each subsequent day shall be assessed against the operator or importer who is required to file the report. The penalties imposed by this subdivision shall be collected as part of the tax and credited to the county revenue fund. If neither the report nor a statement of objection has been filed after more than 60 days have elapsed from the date when the notice was sent, the operator or importer who is required to file the report is guilty of a misdemeanor.

Subd. 6. It is a misdemeanor for any operator or importer to remove aggregate material from a pit, quarry, or deposit or for any importer to import aggregate material unless all taxes due under this section for the previous reporting period have been paid or objections thereto have been filed pursuant to subdivision 4.

It is a misdemeanor for the operator or importer who is required to file a report to file a false report with intent to evade the tax.

Subd. 7. All money collected as taxes under this section shall be deposited in the county treasury and credited as follows, for expenditure by the county board:

(a) Sixty percent to the county road and bridge fund for expenditure for the maintenance, construction and reconstruction of roads, highways and bridges;

(b) Thirty percent to the road and bridge fund of those towns as determined by the county board and to the general fund or other designated fund of those cities as determined by the county board, to be expended for maintenance, construction and reconstruction of roads, highways and bridges; and

(c) Ten percent to a special reserve fund which is hereby established, for expenditure for the restoration of abandoned pits, quarries, or deposits located upon public and tax forfeited lands within the county.

If there are no abandoned pits, quarries or deposits located upon public or tax forfeited lands within the county, this portion of the tax shall be deposited in the county road and bridge fund for expenditure for the maintenance, construction and reconstruction of roads, highways and bridges.

Subd. 8. The county auditor or its duly authorized agent may examine records, including computer records, maintained by an importer or operator. The term "record" includes, but is not limited to, all accounts of an importer or operator. The county auditor must have access at all reasonable times to inspect and copy all business records related to an importer's or operator's collection, transportation, and disposal of aggregate to the extent necessary to ensure that all aggregate material production taxes required to be paid have been remitted to the county. The records must be maintained by the importer or operator for no less than six years.

HIST: 1980 c 607 art 19 s 5; 1Sp1981 c 1 art 10 s 17-19; 1982 c 523 art 13 s 1; 1983 c 342 art 14 s 1; 1984 c 652 s 1; 1986 c 403 s 1,2; 1993 c 375 art 9 s 41,42; 1995 c 264 art 16 s 15; 1996 c 471 art 13 s 15; 1997 c 231 art 8 s 12-14