

# Barr Engineering Company

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## Corporate History

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Barr Engineering Company's staff of over 400 engineers, scientists, and technical support specialists provides environmental, engineering, and information technology services to clients in the manufacturing, forest products, mining, power, and refining industries, as well as attorneys and municipal, state, and federal agencies. Barr was incorporated as an employee-owned firm in 1966 and has offices in Jefferson City, Missouri; Minneapolis, Duluth, and Hibbing, Minnesota; and Ann Arbor, Michigan. Our relevant areas of expertise include: environmental permitting, federal and state environmental impact assessment (including complex, joint state and federal environmental impact statements), environmental compliance, and management assistance; water resources management and planning assistance; and site evaluation and natural resource analysis using GIS data sets.



## Services Offered, Organized by SIN

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### **SIN 899-1: Environmental Planning Services and Documentation**

Specific services that Barr has provided include comprehensive environmental data collection and analysis, third party EIS technical and process support, power-plant-site-permits, surface-water

appropriations permits, groundwater appropriations permits, air and water modeling, transmission line route permits, gas pipeline route permits, NPDES permits, natural resources assessment and planning, regulatory compliance support, and the creation of compliance management tools. Barr also specializes in developing and implementing tailored citizen participation processes for controversial, or potentially controversial, projects. These services fall under the following categories listed in the GSA environmental services schedule:

- Environmental impact statements under NEPA
- Endangered species and/or wetlands analysis
- Watershed and other natural resource management plans
- Environmental program management and environmental regulation development
- Economic, technical, and/or risk analysis

### **SIN 899-7: Geographic Information Services**

To support the EIS services listed in SIN 899-1, Barr has provided a number of GIS services. These services may include the mapping of sensitive or threatened species, land use, groundwater and surface water, comprehensive natural resources, or other information, which, through data interpretation, leads to natural resource planning, permitting strategies, facility site selection, and mitigation plans.

- Mapping and cartography
- Natural resource planning
- Site selection
- Geologic logs, topographic data, 3D/4D interactive visualization packages
- Data interpretation

## **Project Examples**

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**Project Name:** NextGen Third-Party Environmental Impact Statement Contractor Services

**Project Owner:** Western Area Power Administration

**Location:** South Dakota

**Project Description:** When the Basin Electric Cooperative recently proposed constructing a new electric-generating facility in South Dakota, the Western Area Power Administration hired Barr, with its partner, R.W. Beck, to provide third-party technical support for the preparation of a National Environmental Policy Act (NEPA)-required environmental impact statement. The 500–700 megawatt-baseload, coal-fired plant will require associated 230-kilovolt (kv) and 345-kv transmission lines, a water pipeline, and a water intake structure. Other cooperating agencies may include the Rural Utility Service if financing is sought from that agency and the U.S. Army Corps of Engineers due to its involvement in the permitting process for dredge and fill activities for a water intake structure and crossing of navigable waterways by linear facilities.

The Barr/Beck team will provide third-party assistance to Western in implementing the NEPA EIS public participation process and preparing the EIS documents. Specific work tasks include: Project initiation meetings and site reconnaissance

- Technical services for study plan review and support for NHPA and ESA consultations
- Public outreach and scoping support

- EIS scoping summary report preparation
- Work implementation plan preparation
- EIS study and data plan review
- Pre-EIS reports review and identification of data gaps
- Administrative records plan preparation
- Review of preliminary and final administrative record
- Impact identification, analysis, and significance ratings plan
- EIS outline preparation
- Administrative draft EIS preparation
- Draft EIS preparation
- Public hearing support materials review
- Public comments compilation and categorization
- Preliminary final EIS preparation
- Final EIS preparation
- Draft Record of Decision (ROD)
- Mitigation action plan preparation

**Project Name:** Big Stone II Environmental Impact Statement Project

**Project Owner:** Otter Tail Power and Other Utilities

**Location:** South Dakota

**Project Description:** When a South Dakota utility client proposed constructing an electric generating facility adjacent to an existing plant, it added Barr to the project team to assist with the siting and permitting process. The project is a coal-fired baseload facility capable of producing approximately 600 MW of electrical energy. It is the first such facility proposed in South Dakota since the original Big Stone plant came online in the 1970s.

Barr was added to the project team to assist with the federal environmental impact statement and the state siting and water-appropriations permitting process. We have prepared a site application, under the South Dakota energy facility siting rules, which addressed many of the issues covered by the NEPA required Environmental Impact Statement (EIS), such as:

- Air impacts
- Water quality impacts
- Archaeological resources
- Historic resources
- Rare and unique natural resources
- Effects on terrestrial ecosystems
- Effects on aquatic ecosystems

- Economic impacts
- Community impacts

Barr also provided assistance with several other permitting programs, including local zoning and conditional use, wetlands (including delineation of potentially impacted wetland areas in the proposed cooling pond expansion area covering over 500 acres), solid waste disposal, and stormwater NPDES. In the early stages of permitting analysis it was clear that one of the major issues was the supply of water to both the existing plant and the proposed expansion. Barr took on the task of evaluating the possible supply of water. This included both groundwater evaluation and analysis of the long-term yield of the watershed and the amount of storage that would be required to bridge prolonged drought periods. The water-supply evaluation involved:

- Conducting hydrologic analysis, including reverse routing of historic outflows from the reservoir to determine reservoir inflows and then simulating the operation of the existing and proposed future plant
- Evaluating the effect of the proposed increase in generation on local streams and reservoirs.

Big Stone II has been granted the two South Dakota permits for which we assisted in preparing the applications—the water appropriations permit was granted in July, 2006, as was the site permit from the South Dakota Public Utilities Commission. The federal EIS is still in progress, with a decision expected in 2007.

**Project Name:** Mesaba Energy Project

**Project Owner:** Excelsior Energy

**Location:** Taconite, Minnesota

**Project Description:** To help meet projected baseload electricity demands in the upper Midwest, Excelsior Energy, a Minnetonka-based energy development company, is proposing to construct and operate two 606-megawatt integrated-gasification combined-cycle (IGCC) electric generation units in northern Minnesota.

The Mesaba Energy Project is one of the first commercial coal-gasification power plants proposed in the United States and the first baseload plant proposed in Minnesota since the 1980s. This project requires both a federal EIS under NEPA and a state level EIS as part of the state site permitting process. As a result, Barr has served as the regional representative of the environmental permitting team that includes multiple national engineering firms. Barr led the effort to pull together in a single comprehensive application the information needed for three state permits required by the Minnesota Public Utilities Commission: a power plant site permit, a high-voltage transmission-line route permit, and a natural-gas-pipeline route permit. This complex joint application also was required to address a preferred and an alternative site. The joint application was filed in July 2006 and the PUC review process is ongoing. The state site and route permits are expected to be issued in summer 2007.

Barr helped develop the environmental supplement required for the joint state and federal environmental impact statement (EIS) to be completed for this project. As part of this work, we prepared a socioeconomic analysis to evaluate the impact of the proposed plant on both the surrounding communities and the state. The federal EIS record of decision is expected in late 2007.

Barr has also worked closely with Excelsior Energy to develop the water supply and discharge strategy for the plant. We have prepared an NPDES permit application for a new source discharging to an impaired water body that proposes an approach to comply with strict mercury, phosphorus, and other discharge limits. The NPDES permit application was submitted in mid-2006 and is currently being reviewed by the Minnesota Pollution Control Agency. We also prepared a construction cost estimate for constructing features found in the water management plan.

**Project Name:** PolyMet Environmental Assessment and Studies for Environmental Impact Statement

**Project Owner:** PolyMet Mining, Inc.

**Location:** Babbitt, Minnesota

**Project Description:** Barr is currently providing environmental review and permitting assistance to PolyMet Mining Inc.'s NorthMet project, involving one of the world's largest non-ferrous metals deposits. The 4,000-acre site is located near Babbitt, Minnesota. PolyMet purchased certain assets at former taconite-processing plant that is adjacent to the site and will dramatically reduce capital costs for the project.

The development of a large mining project in Minnesota requires an environmental impact statement (EIS), which the Minnesota Department of Natural Resources (DNR) oversees. Because the project will need a Section 404 wetlands permit from the U.S. Army Corps of Engineers, a federal EIS is also required. To accommodate the state and federal EIS requirements, an agreement was reached between the DNR and the Corps to conduct a joint EIS process. Barr assisted PolyMet in negotiating the memorandum of understanding governing this joint process to ensure an efficient schedule.

The EIS process began with an environmental assessment worksheet (EAW) containing information about the project and its potential environmental impacts, including effects on air quality, water quality, wildlife habitat, wetlands, and many other aspects of the community's natural, economic, and social development. Barr assisted PolyMet with the preparation of an information submittal for the EAW and helped negotiate a final scoping decision and EIS schedule with the DNR.

Barr also designed and either carried out or managed numerous baseline studies for the various permit applications as part of the EIS process. The studies included endangered plant species studies, surface-water-quality studies, wildlife surveys, fish and macroinvertebrate surveys, and a cultural resources assessment. Barr managed, oversaw, and provided quality assurance for the work of specialty contractors completing field investigations for these studies. We will use the results to prepare draft applications for all of the required permits, which will then be made available to the DNR's EIS contractor.

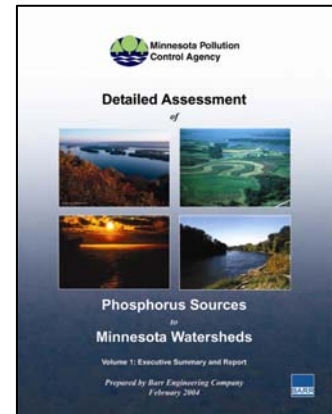
Other complex issues include the permitting of discharges to comply with Great Lakes Initiative water standards, including those for mercury, and the replacement or restoration of the 1,237 acres of wetlands that will be affected by mining operations.

**Project Name:** Detailed Assessment of Phosphorus Sources to Minnesota Watersheds

**Project Owner:** Minnesota Pollution Control Agency

**Location:** Minnesota

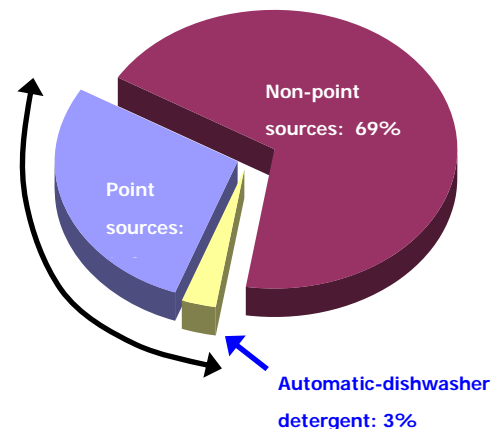
**Project Description:** Using GIS analysis, Barr prepared a report titled *Detailed Assessment of Phosphorus Sources to Minnesota Watersheds* in conjunction with Limno-Tech, Inc., Dr. David Mulla, and Dr. Prasanna Gowda, under the TMDL (total maximum daily load) master contract for the Minnesota Pollution Control Agency. GIS systems were used to develop precipitation runoff estimates for wet, dry, and average years, to estimate non-agricultural non-point source phosphorus loading using stream, watershed, and USGS national landcover databases, and estimate the population served by septic systems for major watersheds using census and MPCA data.



Concerns from the Minnesota State Legislature and other parties about the phosphorus content of automatic-dishwasher detergents resulted in legislation requiring a study of all of the sources and amounts of phosphorus entering publicly owned treatment works (POTWs) and Minnesota surface waters. To provide the MPCA with the information necessary to comply with this new legislation, Barr and our master-contract partners performed an assessment that inventoried: a) the sources and amounts of phosphorus entering Minnesota surface waters for each of the ten major watershed basins and for the entire state of Minnesota, from point and non-point sources during low (dry), average, and high (wet) flow conditions, and b) the sources and amounts of phosphorus entering three different sizes and categories of publicly owned treatment works. The assessment also examined statewide variations in these annual loadings by major basin and flow condition. In addition, Barr looked at the effect of various phosphorus-source-reduction options on receiving-water quality and wastewater-treatment-facility performance.

The assessment found that, under average flow conditions, the point-source total phosphorus contribution is 31 percent of the loadings to surface waters statewide, while non-point sources represent 69 percent. It also found that, statewide, 43 percent of phosphorus entering POTWs was from human waste and 57 percent was from non-ingested sources—with only 2.8 percent of that from automatic dishwasher detergents.

A detailed explanation of the study, the approach and methods used, the findings, and the recommended concepts for lowering the amount of phosphorus that comes from both point and non-point sources can be found on the MPCA's website at [www.pca.state.mn.us/hot/legislature/reports/phosphorus-report.html](http://www.pca.state.mn.us/hot/legislature/reports/phosphorus-report.html).



## Key Environmental Review Staff

Team Member	Education	Relevant Qualifications
<b>John Lee, P.E.</b> Civil Engineer, Vice President	B.S., Civil Engineering, Iowa State University, 1979	<ul style="list-style-type: none"> <li>• 28 years of experience providing consulting services to power industry</li> <li>• Licensed professional engineer in ND and SD</li> </ul>
<b>George Pruchnofski, P.E.</b> Civil Engineer, Vice President	B.S., Civil Engineering, University of Wisconsin at Platteville, 1975	<ul style="list-style-type: none"> <li>• 31 years of environmental experience</li> <li>• Project manager for a study to define the EIS and permitting needs for a new industrial plant</li> </ul>
<b>Nels Nelson, P.E.</b> Civil Engineer, Vice President	M.S., University of Minnesota, Civil Engineering, 1980 B.S., University of Minnesota, Civil Engineering, 1977 B.A., History, Carleton College, 1972	<ul style="list-style-type: none"> <li>• 29 years of experience specializing in environmental review and assessment, and water resources management and planning</li> <li>• Served in leadership role for over a dozen major EAW and EIS projects</li> </ul>
<b>Ray Wuolo, P.E., P.G., C.P.G., C.G.W.P.</b> Hydrogeologist, Vice President	M.S., Geological Engineering, SD School of Mines & Technology, 1986 B.S., Geological Engineering, Michigan Technological University, 1983	<ul style="list-style-type: none"> <li>• 23 years of experience in hydrogeologic site evaluation, aquifer remediation, environmental chemistry, landfill permitting, and environmental impact statements (EIS)</li> </ul>
<b>John Wachtler</b> Senior Environmental Engineer	J.D., University of Minnesota Law School, 1992 M.S., Civil and Environmental Engineering, University of Minnesota, 1987 B.S., Biology, St. John's University, 1983	<ul style="list-style-type: none"> <li>• 18 years of experience with environmental impact statements (EIS)</li> <li>• Completed EIS, route permitting, and public participation activities for MN's first over-200-kilowatt high-voltage transmission line in more than 20 years</li> </ul>
<b>Tina Pint</b> Senior Hydrogeologist	M.S., Geology, University of Wisconsin-Madison, 2002 B.S., Geology, University of Wisconsin-Eau Claire, 1999	<ul style="list-style-type: none"> <li>• 5 years of experience of experience in geology, hydrogeology, and groundwater projects</li> <li>• Worked on Big Stone II and Mesaba Energy power-plant projects for water-supply issues and geology/hydrogeology mapping</li> </ul>

Team Member	Education	Relevant Qualifications
<p><b>Daniel Jones</b> Senior Environmental Scientist</p>	<p>M.S., Biology (Ecology and Evolution), University of Oregon, 1997</p> <p>B.S., Botany and Plant Pathology, Michigan State University, 1988</p>	<ul style="list-style-type: none"> <li>• 17 years of experience in natural resource inventory and management</li> <li>• Documented wetlands, general vegetation, fish and wildlife, and rare-species habitat for an energy-facility-siting project in SD</li> </ul>
<p><b>Andrew Skoglund</b> Acoustical and Air Quality Engineer</p>	<p>B.S., Engineering Science, Iowa State University, 2004</p>	<ul style="list-style-type: none"> <li>• 2 years of experience in air-dispersion modeling, noise and vibration studies, and noise modeling</li> <li>• Completed noise monitoring and modeling for the Big Stone II power plant project in SD</li> </ul>
<p><b>Daniel DeJoode, Ph.D.</b> Environmental Review Specialist</p>	<p>Ph.D., Ecology and Evolutionary Biology, University of Michigan, 2003</p> <p>M.S., Botany, Iowa State University, 1992</p> <p>B.S., Agronomy, Iowa State University, 1989</p>	<ul style="list-style-type: none"> <li>• 15 years of experience in environmental permitting, environmental-impact assessment, wetland delineation, protected-species studies, and natural-resource management</li> <li>• Project manager for a draft EIS for a major highway crossing of Minnesota River</li> </ul>
<p><b>Eric Edwalds</b> Senior Air-Quality Scientist</p>	<p>M.S., Atmospheric Sciences, Oregon State University, 1987</p> <p>B.A., Chemistry and Music, Grinnell College, 1980</p>	<ul style="list-style-type: none"> <li>• 20 years of environmental experience with air dispersion modeling, ambient air monitoring, fugitive-dust generation and transport, and statistical analysis</li> <li>• Completed dispersion-modeling analysis for Xcel's Blue Lake and Angus Anson plants</li> </ul>
<p><b>Jack Kennedy</b> Senior Chemical Engineer</p>	<p>B.S., Chemical Engineering, Washington University, 1975</p> <p>B.A., Pre-Engineering, DePauw University, 1975</p>	<ul style="list-style-type: none"> <li>• 32 years of experience in air quality permitting, modeling, regulatory compliance assistance, air-pollution control technology, and environmental auditing</li> <li>• Managed air-quality permitting for a hydrogen re-forming plant</li> </ul>
<p><b>Cliff Twaroski</b> Environmental Scientist, Vice President</p>	<p>M.S., Forest Management, University of Minnesota, 1982</p> <p>B.S., Forest Management, University of Wisconsin—Stevens Point, 1979</p>	<ul style="list-style-type: none"> <li>• 25 years of experience in project management, risk assessments, environmental review, environmental monitoring, and air studies</li> <li>• Designed mercury mass balance sampling for a taconite facility</li> </ul>



Team Member	Education	Relevant Qualifications
<p><b>Neal Hines, Ph.D.</b> Environmental Engineer</p>	<p>Ph.D., Civil Engineering, University of Minnesota, 2004 M.S., Civil/Environmental Engineering, University of Minnesota, 1996 B.A., Chemistry (conc. Environmental Studies), Grinnell College, 1993</p>	<ul style="list-style-type: none"> <li>• 6 years of experience in environmental engineering</li> <li>• Specializes in studying mercury and methylmercury in the aquatic environment</li> <li>• Developed and implemented innovative sampling methods to quantify mercury and methylmercury in wetland environments</li> </ul>
<p><b>Tom MacDonald, P.E., CFM</b> Senior Civil Engineer</p>	<p>M.S., Civil Engineering, University of Minnesota, 1991 B.S., Civil Engineering, University of Minnesota, 1989</p>	<ul style="list-style-type: none"> <li>• 17 years of experience with a broad range of hydrology- and hydraulics-related projects</li> <li>• Conducted a water-availability study for 500MW, lignite-fired electrical generating facility in ND</li> </ul>
<p><b>Miguel Wong, P.E., Ph.D.</b> Water Resources Engineer</p>	<p>Ph.D., Civil Engineering, University of Minnesota, 2006 M.S., Hydraulic Engineering, IHE-Delft: The Netherlands, 1995 B.S., Civil Engineering, Pontifical Catholic University of Peru, 1992</p>	<ul style="list-style-type: none"> <li>• 8 years of experience in hydrologic modeling, hydraulic design, river mechanics, and sediment transport processes</li> <li>• Managed EIS work as well as environmental compliance and management programs for mining clients</li> </ul>
<p><b>Cheryl Feigum, Ph.D., P.S.S., P.W.S., P.S.C.</b> Senior Environmental Scientist</p>	<p>Ph.D., Soil Science, North Dakota State University, 2000 M.S., Zoology, North Dakota State University, 1995 B.A., Biology, St. Olaf College, 1980</p>	<ul style="list-style-type: none"> <li>• 10 years of experience in water sampling, wetland assessment and environmental documentation</li> <li>• Developed state and federal environmental documentation including NEPA regulations and EAWs</li> </ul>
<p><b>Brent Lindstrom</b> GIS Administrator</p>	<p>M.S., Geography (emphasis in GIS), St. Cloud State University, 1994 B.A., Geography, St. Cloud State University, 1992</p>	<ul style="list-style-type: none"> <li>• 13 years of experience in geographic information systems (GIS)</li> <li>• Managed numerous GIS projects for clients in the power industry and other projects involving natural resources</li> </ul>

## GSA Price List for Year One—2007

Labor Category Title	Hourly Billing Rate				
Labor Category	Year 1	Year 2	Year 3	Year 4	Year 5
Principal Engineer/Scientist	\$ 160.00	\$165.76	\$171.73	\$177.91	\$184.31
Senior Engineer/Scientist	\$ 125.00	\$129.50	\$134.16	\$138.99	\$144.00
Experienced Engineer	\$ 115.00	\$119.14	\$123.43	\$127.87	\$132.48
Junior Engineer	\$ 85.00	\$88.06	\$91.23	\$94.51	\$97.92
Senior Environmental Engineer/Scientist	\$ 170.00	\$176.12	\$182.46	\$189.03	\$195.83
Experienced Environmental Engineer/Scientist	\$ 137.75	\$142.71	\$147.85	\$153.17	\$158.68
Junior Environmental Engineer/Scientist	\$ 96.36	\$99.83	\$103.42	\$107.15	\$111.00
Senior Water Resources Engineer/Geologist	\$ 160.00	\$165.76	\$171.73	\$177.91	\$184.31
Senior CADD/ Field Technician	\$ 102.14	\$105.82	\$109.63	\$113.57	\$117.66
Technician	\$ 85.00	\$88.06	\$91.23	\$94.51	\$97.92
Senior Communications Specialist	\$ 100.00	\$103.60	\$107.33	\$111.19	\$115.20
Senior Administrative Support	\$ 80.00	\$82.88	\$85.86	\$88.95	\$92.16
Administrative Support	\$ 69.00	\$71.48	\$74.06	\$76.72	\$79.49