

## Proposed Project 6: Review of Iron Ore Pellet Binders, With Emphasis on Organic Binders

**Objective(s):** Review the advances in pellet binder technology, and identify binders that could replace bentonite without introducing problems with dust or moisture control.

**Justification:** While bentonite is an effective binder for iron ore pellets, it does introduce silicates into the pellet that make it more difficult to meet the silica specification. Binders that do not contain silica and are cost-competitive with bentonite would therefore be of considerable interest, provided that they can continue to bind the pellets together at high temperatures until they begin to sinter. Methods for increasing the effectiveness of binders would also be valuable because this would reduce the quantities needed to achieve the desired pellet strength, both reducing costs and limiting the potential for contaminating the pellets.

**Description of Proposed Work:** The investigators will carry out an extensive update of their original review of binder technology that was prepared in 1997-98, with particular emphasis on new organic binders that are expected to be significantly more temperature-resistant than previous organic binders. In addition to reviews of the open literature, we will travel to operating plants (both in Minnesota and overseas) to consult with plant personnel and to review internal documents on binder use and behavior. The project will be divided into three parts: (a) An initial study of binders that are of most immediate interest to industry, to be completed in the first 3 months; (b) A thorough study to collect all available information, to be completed in the first year; and (c) A fully checked and fine-tuned final report, including follow-up of useful leads found in the first year, to be completed in the second year.