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| <b>Customer</b> | Precious Metals Production                |
| <b>Service</b>  | Environmental Technology Selection/Design |



Strategic Solutions  
**SSI Associates, Inc.**

## Technology Selection and Implementation for SO<sub>2</sub> Emissions Control

**Selection, design and startup support for an SO<sub>2</sub> emissions control system for a new ore roasting facility**



### Challenge

An international precious metals mining and manufacturing company faced extraordinarily tight constraints on SO<sub>2</sub> emissions in siting a grassroots ore roasting facility in the western US. Regulatory requirements limited stack emissions to a maximum of 100 ppm with the capability for future reductions to 20 ppm for uncontrolled releases equivalent to 2 vol. % to over 15 vol. %.

### Approach

Strategic Solutions staff worked with the company from the outset of the project to select the most appropriate technology, prepare the basic process design, support the detailed engineering/design, assist in startup and subsequently perform optimization evaluations to expand capacity and enhance performance capabilities.

- **Technology Selection** - In selecting the technology, over 80 different commercialized SO<sub>2</sub> technologies were screened to identify the technically feasible candidates. These were then subjected to both an economic evaluation and an operability/risk assessment to select the most cost-effective alternative. Concentrated mode lime dual alkali technology was ultimately chosen with partial open-loop design.
- **Design** - The basic process engineering package was prepared -- material and energy balances; equipment selection and sizing; and design specifications for all major equipment. Assistance was then provided to the Owner's Engineer for completion of detailed design including review of equipment bids, development of control philosophies, finalization of P&IDs, and preparation of operating manuals.
- **Startup** – Our staff provided onsite support to startup including pre-commissioning walk-downs and follow-on post-commissioning troubleshooting.

### Value/Result

- Met the required plant startup date
- Achieved SO<sub>2</sub> emissions limits from the beginning of hot operations
- Achieved continuous operation following completion of startup and plant has not required any outages or curtailment in operations
- Plant operation demonstrated twice the “nameplate” capacity due to the inherent flexibility in the dual alkali system equipment design and chemistry – up to 16 vol. % inlet SO<sub>2</sub> (vs. 10 vol. % design) and 25% above design gas flow
- Subsequent studies conducted three years after startup defined options to further expand the operating “window” to extend reliability over a wider range of operating conditions