



## CONSTRUCTION COST ESTIMATING/CASH FLOW PLANNING

Accurate cost, schedule and cash flow estimates are essential tools for planning, financing and managing construction projects. EMC<sup>2</sup> staff brings the combined engineering, construction and economic analysis experience necessary to develop accurate estimates and to identify areas and degree of uncertainty within these estimates. We follow a consistent approach that includes a rigorous quality control checking process whether we are preparing budgetary estimates to help our clients select between project alternatives or preparing detailed hard construction bid estimates for bonding or project financing purposes.

**Copper Mine Closure Cost Estimate, Michigan** - EMC<sup>2</sup> staff developed a detailed facility closure cost estimate to provide reclamation cost and cash flow projections for surface reclamation of an underground copper mine. Cost estimating work included: developing take-offs from construction drawings of each facility to develop a focused building demolition cost estimate that included salvage and scrap estimates, site reconnaissance to determine extent of environmental impacts, and regrading and capping cost estimates for closure of approximately 5,000 acres of tailings ponds and several on-site landfills.

**Airport Expansion Fill Cost and Schedule Evaluation, Western U.S.** - EMC<sup>2</sup> developed cost and schedule estimates for alternative methods of supplying and delivering approximately 23 million cubic yards of fill material required for expansion of an international airport located in the western United States. The work included evaluating the availability, suitability, cost, and permitting requirements for various fill supply options including: development of on-site borrow pits; development of new, or use of existing, marine-accessible borrow pits; use of existing overland truck-accessible pits; or use of surplus material from other local construction projects. The evaluation also included estimating the cost and schedule differences between various delivery options including conveyor only, barge/conveyor, barge/trucking and trucking only.

**Vat Leach Demolition Cost Estimate, Arizona** - EMC<sup>2</sup> staff developed a demolition plan identifying phased costs and schedules for a \$1M demolition of 10 concrete storage vats and associated pipeline, conveyors and excavator assembly used to leach high grade ore at this copper mining facility. The vats were replaced by a heap leach operation.



**Leach Vats Demolition Cost Estimate**

**Coal Mine Closure Cost Estimate, Western U.S.** - EMC<sup>2</sup> developed detailed facility closure cost and schedule estimates to provide cost and cash flow projections for reclamation of a large coal mine in the western United States. The work included evaluating the technical/regulatory issues associated with various pit reclamation options including recontouring to approximate original contour and closure as shallow or deep lakes to minimize regrade quantities. Present value cost and cash flow schedule estimates were developed for immediate closure and for continued mining/phased closure scenarios. EMC<sup>2</sup>'s scope also included evaluating various contracting options for completing the reclamation work including using the mine's existing equipment fleet and labor force, using an outside reclamation contractor, or using a combination of both.

**Miami Mine, Arizona** - EMC<sup>2</sup> staff completed an engineering evaluation/cost analysis of cover options for seven tailings impoundments covering 1,200 acres at this copper mine. The evaluation considered numerous options for three basic types of covers: infiltration controlling, erosion controlling and oxygen-consuming. Cover options were evaluated based on performance, cost, constructability, design life, future land use, maintenance requirements and impacts from the tailings impoundments reclamation to ongoing operations.

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