



TECHNICAL SERVICES



Permitting & Regulatory Experience

- Resource Conservation and Recovery Act (RCRA),
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),
- National Environmental Policy Act (NEPA),
- Clean Air Act (CAA),
- Clean Water Act (CWA),
- Underground Injection Control (UIC) Class I, II, and V,
- Toxic Substances Control Act (TSCA),
- Underground Storage Tank (UST),
- Oil Pollution Act (OPA),
- Safe Drinking Water Act (SDWA),
- Emergency Planning and Community Right-to-Know Act (EPCRA),
- Pollution Prevention Act,
- EPA RI/FS, SI/CMS, and RD/RA
- Spill Prevention, Control, and Countermeasure Plans (SPCC),
- Storm water permits (MS4s, construction, and industrial),
- Storm Water Pollution Prevention Plans (SWPPPs), and
- Phase I and II environmental site

MINE ENVIRONMENTAL PERMITTING

Engineering Analytics (EA) staff has successfully worked with clients and regulatory agencies to develop reasonable approaches for environmental permitting and remediation. EA provides regulatory assistance for up-front permitting, operational compliance, updates, closure, and remediation. We are experienced in developing and supporting:

- baseline environmental conditions,
- aquifer protection permits,
- environmental impact statements (EIS),
- environmental assessments,
- new facilities and facility expansion,
- corrective action plans,
- consent orders, and
- reclamation plans.

EA identifies critical path activities driven by the permitting process rather than focusing solely on investigative, design, and construction activities. Our experience and knowledge in all areas of environmental law allows us to efficiently complete state and federal permits.

Environmental Concerns

EA staff are experienced in resolving a wide range of environmental issues at mines and industrial sites. We deal with surface water, groundwater, soils, stored wastes, and air.

- acid-mine drainage,
- heavy metals,
- pit-lake modeling and geochemistry,
- hydrocarbons,
- halogenated solvents,
- radionuclides,
- explosives, and
- mercury, lead, and arsenic air emissions.

Environmental Solutions

EA integrates its permitting experience with engineering expertise to develop environmental solutions through design, implementation, and operation of site remediation measures.

- excavation, treatment and disposal of contaminated soils,
- in-situ fixation/stabilization of contaminated soils,
- groundwater extraction and treatment,
- in-situ biological and chemical treatment of groundwater,
- capping/risk reduction remediation,
- in-situ remediation of NAPL compounds, and
- natural attenuation demonstrations.



Modeling Experience

- **Groundwater Flow / Fate and Transport**
 - MODFLOW
 - MODFLOW-SURFACT
 - MODFLOW/RT3D
 - TWODAN
 - SUTRA
 - Spreadsheet transport models (e.g., Domenico)
- **Unsaturated Zone Flow / Transport**
 - VADOSE/W
 - SEEP/W
 - CTRAN/W
 - HYDRUS-2D
 - SESOIL
 - SUTRA
 - UNSAT2
- **Geochemical**
 - PHREEQC
 - MINTEQA2
- **Risk-Based Statistical Models**
 - ProUCL

We provide cost effective environmental solutions to the mining industry.

PROJECT EXAMPLES

COVER AND REPOSITORY DESIGN

Umetco Minerals Corporation, Uravan, Colorado

Engineering Analytics (EA) assisted in preparation of modifications to the remedial action plan for this CERCLA site. Designed cover alternatives. EA staff designed the cover for the raffinate spray area and the repository considering radon flux, frost protection, settlement, cover cracking, erosion protection, and stormwater diversions and runoff control features

PIT LAKE MODELING

Rosemont Copper Mine, Tucson, Arizona

Engineering Analytics staff led development and completion of a regional groundwater flow model that simulated open-pit dewatering, pit-lake formation, and post-closure conditions to support the Environmental Impact Statement (EIS) and Aquifer Protection Permit (APP). A comprehensive flow model sensitivity analysis provided a range of potential impacts to stream flows, riparian vegetation, and springs due to the proposed 2,000-foot deep, open-pit mine.

COMPREHENSIVE RECLAMATION AND CLOSURE PLAN

Umetco Minerals Corporation, East Gas Hills, Wyoming

Engineering Analytics provided reclamation plans for the uranium mine and mill operations to the NRC. Reclamation plan included an inactive uranium tailings impoundment, two evaporation ponds, four mined pits, and a below grade tailings impoundment. Completed a site-wide characterization of the groundwater and geochemistry, a risk assessment analysis for clean-up of radiological contaminants, seepage analyses, stability analyses, and radon attenuation analyses. The reclamation plans were presented to the .

FOUR CORNERS PIT LAKE AND MINE ASSESSMENT

IMC Agrico, Mulberry, Florida

Engineering Analytics staff completed a comprehensive environmental and geochemical assessment of pit lakes and settling ponds. Groundwater and surface-water impacts included arsenic, boron, lead, gross-alpha radiation and low pH. Detailed hydrologic and geochemical modeling intended to reduce the concentrations of these chemicals to acceptable levels and provided the basis for engineering solutions that involved both water treatment and re-routing and mixing of different water masses.

AQUIFER PROTECTION PERMITS

San Manuel Smelter / Mine Site and Pinto Valley Mine, Arizona

APPs are prepared to demonstrate that facilities have incorporated the Best Available Demonstrated Control Technology (BADCT) into their operations. The permits involved intensive investigation of all potential discharge points at the site including valves, pipelines, tanks, pits and the mines themselves to either document compliance or design required control technologies that could be implemented in a reasonable period of time.

UIC CLASS I DISPOSAL WELL PERMIT

Cameco Resources, Dawes County, Nebraska

Engineering Analytics staff prepared a Class I Underground Injection Control (UIC) permit application for disposal of non-hazardous wastes generated by commercial in-situ uranium mining operations in northwest Nebraska. The project involved a new injection well to supplement existing deep disposal well capacity for expanded operations in the area.