

Globeville Smelter Site

Reclamation and Remediation



Project Highlights

In **only 24 days from notice to proceed**, and in difficult weather conditions, Ensero designed, constructed and commissioned a new water treatment plant (WTP), consistently achieving treatment goals for arsenic, cadmium, selenium, and zinc.

A permanent soil and groundwater remedy enabled full site release and ultimately facilitated redevelopment, **creating nearly 1,000,000 ft² of new built construction** and an award-winning brownfields redevelopment project.

Ensero's groundwater and soil remedies enabled shut down of the active WTP after four years and **eliminated the need for perpetual treatment and site maintenance**.

The entire program was completed in only 4.5 years and on-budget under a fixed-price contract secured by a performance bond.

On-site soil stabilization and reuse eliminated the need for, and risk associated with, off-site disposal.

The Challenge

The Globeville Smelter Site, formerly owned by ASARCO, operated from the 1870s through 2006. It smelted and purified lead, cadmium, and other specialty metals and produced arsenic trioxide. Over a century of handling hazardous materials resulted in substantial environmental impacts, including elevated levels of lead, zinc, cadmium, and arsenic in soil and groundwater. The site was listed on the National Priorities List (Superfund) in 1993. Following ASARCO's bankruptcy, the Colorado Department of Public Health and Environment (CDPHE) became a trustee for the site remediation, and selected Ensero as the lead environmental consultant and general contractor for site remediation.

The Ensero Solution

Ensero worked closely with the Site redeveloper, EnviroFinance Group, to expedite cleanup for redevelopment and to maximize the square footage available for redevelopment under industrial standards. We designed and implemented remedies to treat heavy metal-contaminated groundwater and runoff, 13 acres of low pH soils, 17 acres of waste gypsum materials, and widely distributed soils high in arsenic.

Expedited redevelopment was made possible through Ensero's innovative soil stabilization approach. Acid and metals contaminated soil was mixed with high pH gypsum, crushed site demolition slag, and asphalt to create geotechnically stable fill with leaching potential below site-specific standards (per SPLP SW-846 Test Method 1312). The stable fill was placed, compacted, and then covered with clean soil to enable the safe construction of buildings.

Ensero implemented comprehensive, Site-wide in-situ groundwater remedies. We created subsurface sulfate-reducing conditions in the upland area to immobilize dissolved metals in groundwater and installed reducing permeable reactive barriers and reactive zones in the lowlands to precipitate metals in situ. Metals concentrations in groundwater decreased to below maximum contaminant levels (MCLs) at the property line within four years.



Before and After Redevelopment of the Former Globeville Smelter

After decommissioning the more than 20-year-old WTP, Ensero designed, constructed, and commissioned a new WTP to treat source area groundwater and runoff. The modernized WTP (designed, built, and commissioned within 24 days) included ferric iron coagulation for arsenic removal, lime coagulation for other metals removal (including iron, cadmium, lead, and zinc), and automated pH and turbidity control. Effluent consistently achieved treatment goals for arsenic, cadmium, selenium, and zinc, and was discharged to the Publicly Owned Treatment Works (POTW). Ensero operated the WTP in compliance with the permit requirements for four years (2011 to 2015), while completing the source area soil and in-situ groundwater treatments. The in-situ groundwater treatment was effective, eliminating the need for the WTP, and CDPHE granted permission to shut down and decommission the WTP in 2015.

Ensero's site-wide remediation approach was so successful that the Site was delisted from the National Priorities List in 2013 and allowed to transition to a state-led voluntary cleanup program, where it was completed with full regulatory release. Successful completion ultimately enabled redevelopment through an award-winning brownfields redevelopment project that created nearly 1,000,000 ft² of new construction.

Vital Statistics

- Ensero mixed 600,000 cy of acid- and metals-contaminated soil from the plant area with 300,000 cy of high pH gypsum waste (generated historically at the on-site WTP), and 100,000 cy of crushed site demolition slag and asphalt to create over one million cy of geotechnically stable fill with leaching potential below site-specific standards (per SPLP SW-846 Test Method 1312). This remedy eliminated the need to import fill to support redevelopment activities.
- Specific work elements included preparation of work plans, quality assurance project plans (QAPPs), sampling and analysis plans (SAPs), data gaps work plan, Remedial Action Work Plan (Statement of Work), remedial planning, engineering design, permitting, remedy implementation, and stakeholder engagement (regulatory agencies, the public, and development interests).



Project Office

Ensero Solutions
333 West Hampden Avenue
Suite 935
Englewood, CO 80110
+1 (303) 862-3929

Headquarters

Ensero Solutions
305 W Magnolia St, PMB 225
Fort Collins, CO 80521
+1 (970) 632-2242
info@ensero.com