

Anaconda Regional Water, Waste & Soils Operable Unit

Geographic Information System (GIS)

Land Reclamation for part of the Largest Superfund Site in the United States

The Anaconda Smelter National Priority Listing Superfund Site is the largest superfund site in the United States. Decades of mining in Butte and Anaconda, Montana have led to environmental impacts over a large geographical area. The superfund site is broken into operable units, one of which is the Anaconda Regional Water, Waste & Soils Operable Unit (ARWW&SOU). The ARWW&SOU contains 6,000 acres of mine tailings, 16,000 acres of upland soils that have been impacted by smelter emissions, and 32,000 acres of affected ground water. The current land owner, ARCO Environmental Remediation L.L.C. (AERL), was directed by the United States Environmental Protection Agency to remedy these impacts.

The professional services of DJ&A, P.C. were retained by AERL to develop a GIS to aid in the remediation design process.

This flowchart defines the system architecture.

ENVIRONMENTAL

Environmental data includes:

- ~ Soil Samples
- ~ Surface Water Monitoring
- ~ Ground Water Monitoring
- ~ Vegetation Conditions
- ~ Atmospheric Conditions



PRODUCT



DATA



BASE MAP

Base map information was developed from:

- ~ Aerial Ortho-Rectified Photos (Planimetric Features)
- ~ Aerial Photogrammetry (Planimetric and Topographical Features)
- ~ Digital Raster Graphics (Planimetric and Topographical Features)
- ~ GPS Survey (GPS Control Network and Planimetric Features)
- ~ Conventional Survey (Planimetric and Topographic Features)

LAND USE/OWNERSHIP

Land use and land ownership data includes:

- ~ Private, County, State & Federal Owned Lands
- ~ Agricultural Use
- ~ Zone Usage (Commercial, Industrial, Residential)
- ~ Wetlands Delineation
- ~ Conservation Easements
- ~ Utility Easements
- ~ Historic and Cultural Delineation
- ~ Dedicated Developments

RESULTS

With such a large volume of information, a system with the ability to track and validate the integrity of the data being used for reclamation design was a key component to the success of the remediation effort of this site. The Anaconda Regional Water, Waste & Soils Operable Unit GIS provided this framework. This GIS allowed the AERL project design team to develop a remediation design, monitor construction quality assurance, support the monitoring and maintenance phase of the project, and provide an accessible record of compliance. In the future, this system will be used to further monitor and evaluate remedy performance for effectiveness, thus allowing for potential delisting of impacted areas.

REMEDATION

The following was developed through integration, analysis and comparison of the various datasets within the GIS:

- ~ Data Summary Reports and Sample Location Maps
- ~ Terrain Analysis (i.e. steep slope areas)
- ~ Land Use/Land Ownership Summary Reports and Overview Maps
- ~ Cost Analysis Reports
- ~ Remedy Acreage Summary Reports and Site Maps

AERL



Client: ARCO Environmental Remediation L.L.C.
Anaconda, Montana

DJ&A, P.C.

Engineers: DJ&A, P.C. Consulting Engineers and Land Surveyors
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