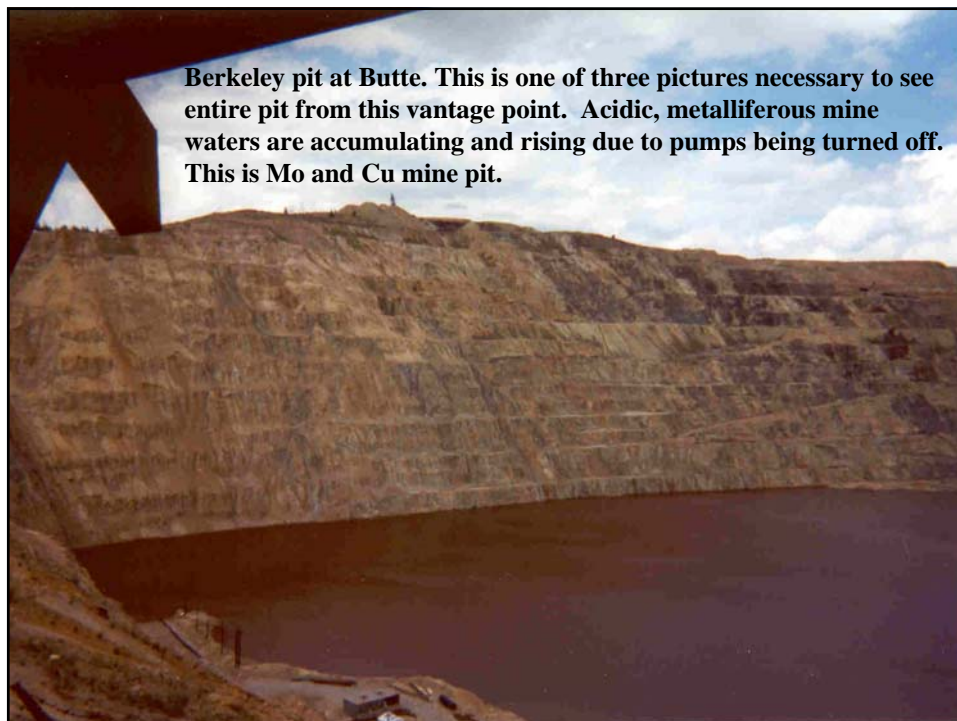


## **Major Impacts of Metal Mining, Smelting and Processing**

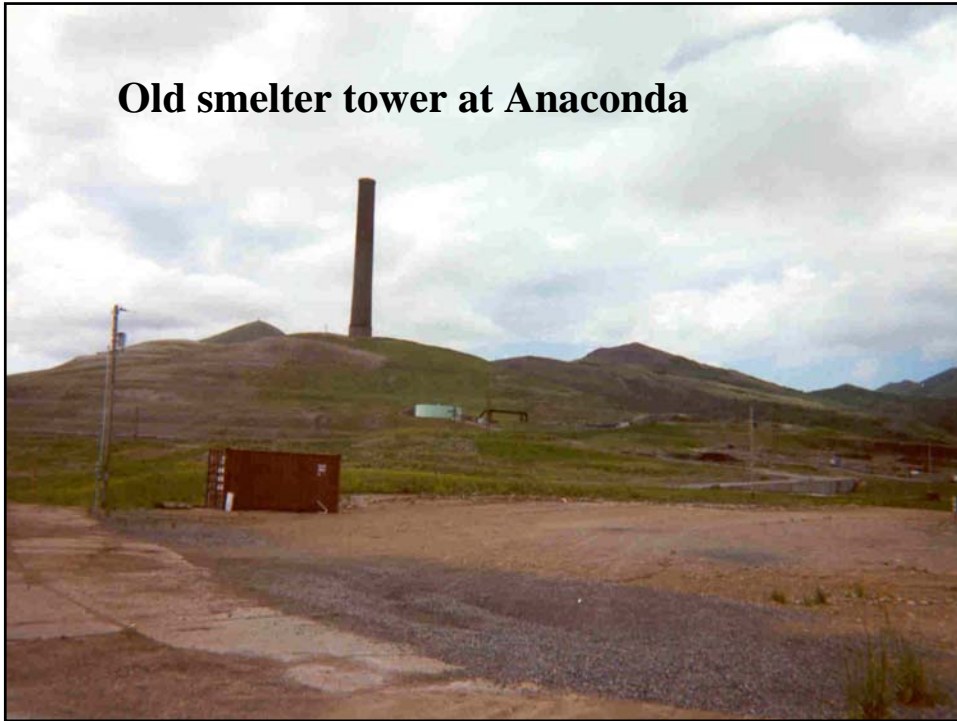
**Covered in Chaps. 28 (Gold mining), 32 (Metal mine tailings) and 33 (Smelter impacts) in your book.**

**Important impacts and remedial approaches are summarized in these lecture notes.**

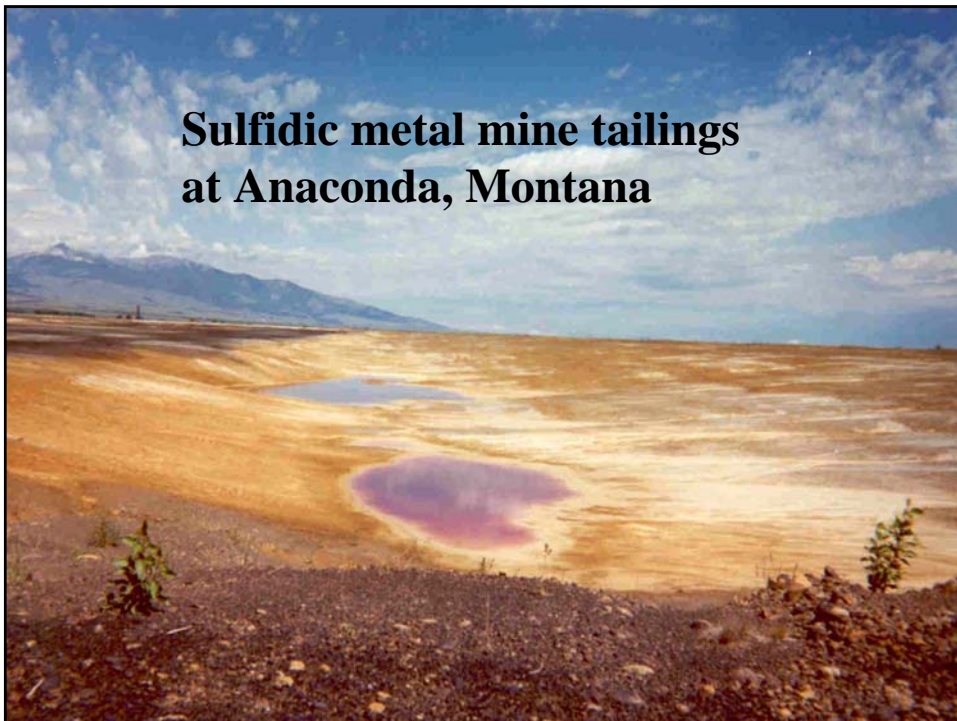
**Many metals are mined as sulfides. Common impacts include AMD, acid spoils, acid and metalliferous tailings, smelter slags and solid wastes, and smelter airborne emissions.**



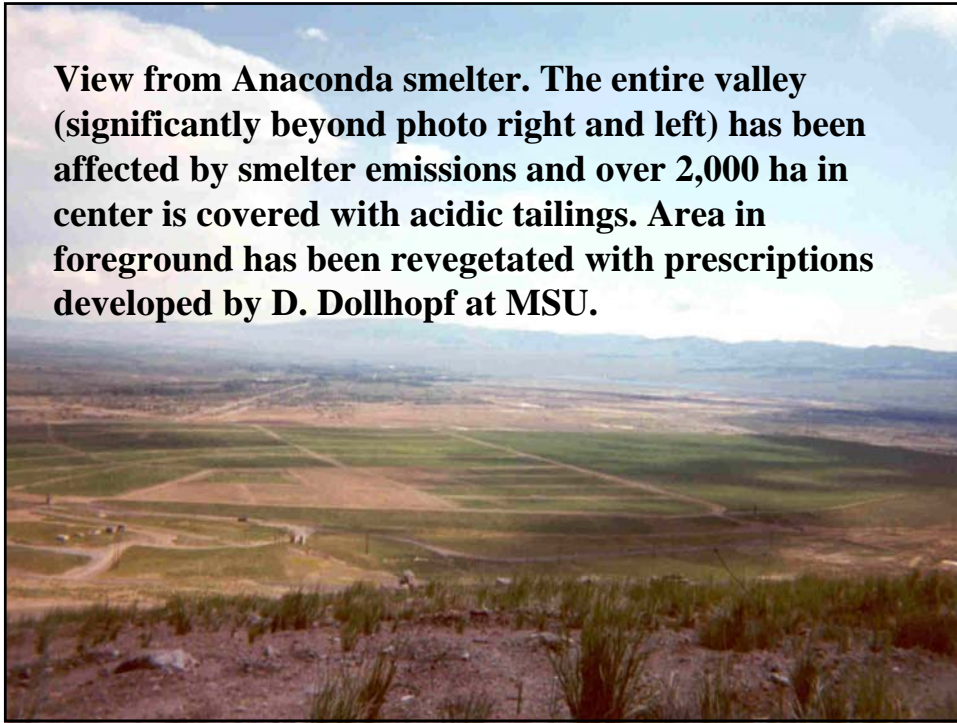
**Old smelter tower at Anaconda**



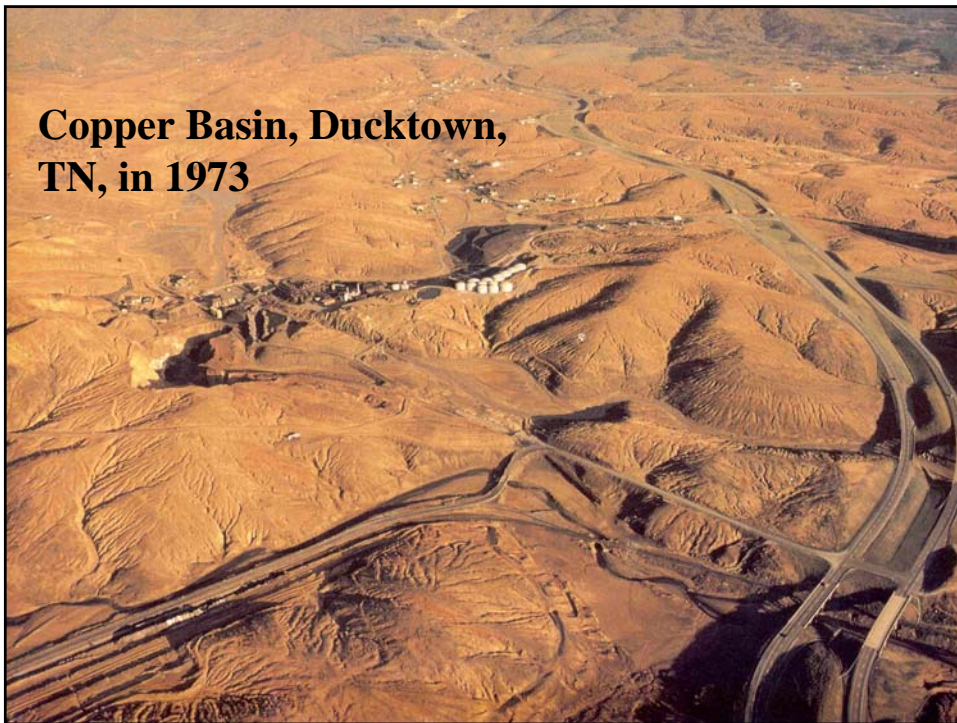
**Sulfidic metal mine tailings at Anaconda, Montana**

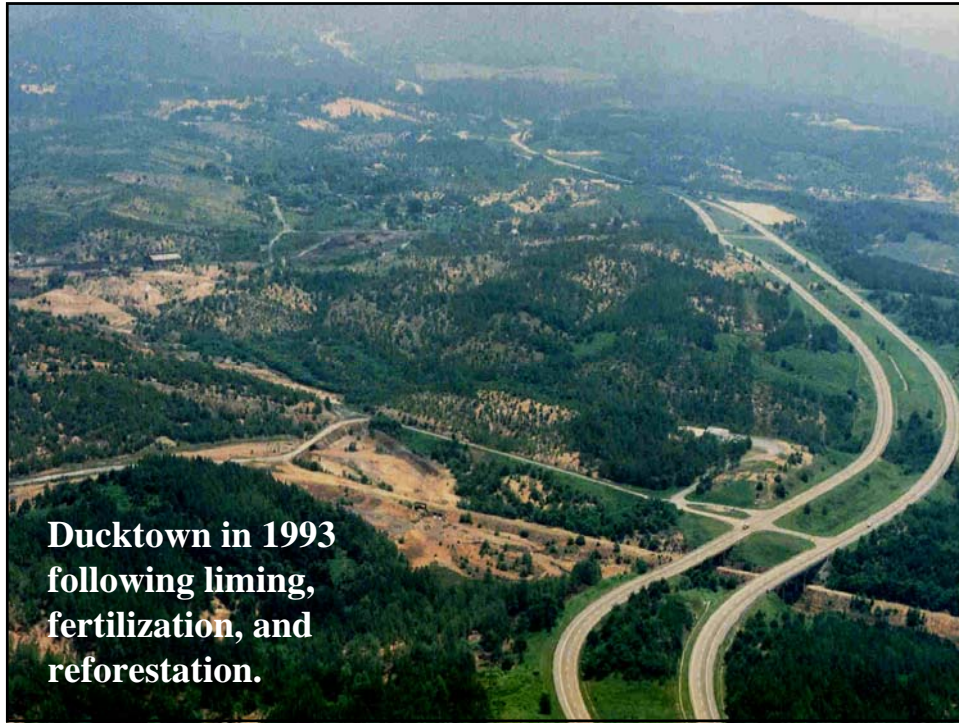


**View from Anaconda smelter. The entire valley (significantly beyond photo right and left) has been affected by smelter emissions and over 2,000 ha in center is covered with acidic tailings. Area in foreground has been revegetated with prescriptions developed by D. Dollhopf at MSU.**



**Copper Basin, Ducktown, TN, in 1973**





**Ducktown in 1993 following liming, fertilization, and reforestation.**



**Pb/Zn smelter slag site in Katowice Poland in 1994. Materials were 3 to 10% total-Zn, > 1000 ppm water soluble Zn, and > 90 ppm water soluble Cd.**

**Non-acidic Pb/Zn tailings in Poland with EC > 5 mmhos/cm and water soluble Zn > 1000 mg/L.**



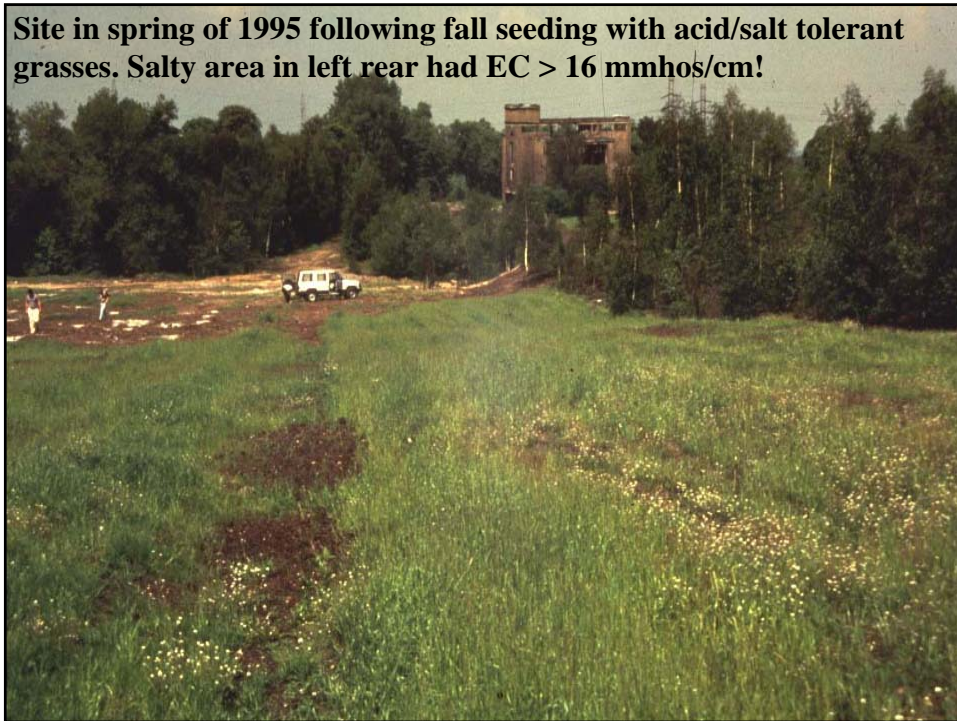
**Application of waste lime (partially neutralized CaO from acid water treatment) and biosolids to site per prescription by Daniels, Stuczynski, and Chaney.**



**Biosolids application at 150 to 300 tons/acre (N leaching not a concern here!)**



**Site in spring of 1995 following fall seeding with acid/salt tolerant grasses. Salty area in left rear had EC > 16 mmhos/cm!**



**Reverse view of same site in June 1996. Salty area is now in foreground after being capped with 15 cm of waste lime plus 300 tons per acre of biosolids and reseeded in fall of 1995.**



**Site in August of 2004. Bare strips are untreated alleys. Some trees were planted, many invaded.**



