Willow Creek
Reclamation Committee

Guinevere Nelson
Watershed Coordinator
Figure 1. Generalized geologic map of Creede caldera and surrounding area. Arrows show location of cross section shown in Figure 3 (modified after Lipman, this volume). Mtn is abbreviation of Mountain.
Creede Area History
(Historic Photos Courtesy of the Creede Historical Society)
Lower Creede, Looking Up.
may 1892, No. 11.
Creede Mining District Ore Output in Tons from 1889-1892

Total Estimated Value: $4,215,800

Source: A Silver Camp Called Creede: A Century of Mining; Richard C. Houston
<table>
<thead>
<tr>
<th>Metal</th>
<th>Value</th>
<th>Ounces</th>
<th>Value</th>
<th>Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>$3,255,33</td>
<td>1,056,108</td>
<td>Silver</td>
<td>$53,917,856</td>
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<tr>
<td>Copper</td>
<td>$1,576,930</td>
<td>Pounds</td>
<td>5,188,186</td>
<td>Lead</td>
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<tr>
<td>Zinc</td>
<td>$8,982,599</td>
<td>Short tons</td>
<td>39,443</td>
<td>Zinc</td>
</tr>
</tbody>
</table>
Problems

- High loads of heavy metals in Willow Creek (Pb, Zn, Cu, Cd, Al, and Mn)
- 2 large fish kills in the Rio Grande River following flood events
- Degraded Riparian Habitat
- Limited or non-existent fish populations in Willow Creek
- Flood hazards above the City of Creede
Early Watershed Work

Consolidation and capping of Humphries Mill settling pond remnants into the Emperius Tailings Pile
Passive Mine Drainage Treatment System at Solomon Mine Adit
WELCOME TO
CREEDE
586 NICE FOLKS &
17 SOREHEADS
Genesis of the Willow Creek Reclamation Committee

- CDPHE and EPA Preliminary Assessment findings and subsequent reports prompt potential listing of Creede Mining District on National Priorities List.

- NRCS and Rio Grande Conservation District employees, Steve Russell and Mark Haugen joined the Creede City Council held a meeting for the purposes of beginning to address Willow Creek below Creede (1997).
WCRC Goals

1) **Protect the Rio Grande from future fish kills** associated with nonpoint source releases during unusual hydrologic events

2) **Improve the visual and aesthetic aspects** of the Willow Creek watershed and its historical mining district

3) Implement appropriate and cost-effective **flood control** and stabilization measures for nonpoint sources

4) Protect and preserve **historic structures**

5) **Reclaim the Willow Creek floodplain** below Creede to improve the physical, chemical, biological, and aesthetic qualities of the creek as an integral part of the local community

6) Continue to **improve water quality and physical habitat** quality in the Willow Creek watershed as part of a long-term watershed management program
1. Identifying sources of heavy metals
2. Characterizing transport of heavy metals to surface waters
3. Quantifying heavy metals loading to Willow Creek and the Rio Grande River
4. Characterizing mine waste materials
5. Biological assessment of aquatic resources
6. Characterizing hydrological conditions in underground mine workings
Characterizing the Watershed

Key Partners:

(2) Report on Characterization of Groundwater in the Alluvial Deposits beneath the Floodplain of Willow Creek below Creede

(3) Report on Characterization of Waste Rock and Tailings Piles above Creede, Colorado

(4) Report on Characterization of Fish and Aquatic Macroinvertebrates in Willow Creek

(5) Evaluation of Metal Loading to Streams near Creede, Colorado
Projects:

The Fives Mines Project
(Reclamation of 5 Tailings/Waste Piles)

- Park Regent Mine
- Midwest Mine
- Gormax Mine
- Phoenix Mine
- Phoenix Park Mill Site

Project Partners: Colorado Division or Reclamation Mining and Safety, United States Forest Service, CDPHE Non Point Source Program.
Project Cost: $193,600
Park Regent Mine 1895
Phoenix Mine
Phoenix Park Mine
Phoenix Park
Mill Site
Phoenix Park
Mill Site
The Nelson Tunnel Dewatering Amethyst, Last Chance and Commodore Waste Pile Project

Project Partners: WCRC, CDPHE Non Point Source Program, Colorado Division of Reclamation Mining and Safety, Ken Wyley, EPA

Project Cost: $ 572,622.00
Nelson Tunnel Dewatering
Nelson Tunnel
FIGURE 9
WATER QUALITY SAMPLE LOCATIONS (CURRENT AND FUTURE)

Current and Future Water Sample Locations:

A. Commodore 5 Level Portal
B. Nelson Tunnel Portal
C. Nelson Tunnel @ Corkscrew Raise
D. Nelson Tunnel @ Bachelor Shaft
E. Nelson Tunnel @ Javelin Shaft
F. Commodore 5 Level @ McClure Drift
G. Commodore 5 Level - Peak Drift Borehole
H. Nelson Tunnel @ Daylight Winze
I. Nelson Tunnel @ Commodore Shaft
J. Flow Down 44 Raise
K. Nelson Tunnel @ No Name Winze
L. Commodore 5 Level Upwelling
M. Nelson Tunnel @ Del Monte Raise
N. Flow Down Amethyst 3 Shaft
O. Stopes @ Amethyst 3 Shaft
P. Commodore 5 Level - Berkshire Shaft
Q. Nelson Tunnel @ Decline
R. 19 Raise Below Commodore 5 Level
S. Flow Down Park Regent Shaft
Amethyst and Last Chance
Clean Up
Amethyst Mine
Amethyst/Last Chance Mines before reclamation
Amethyst Clean Up Site
The Windy Gulch Project

Project Partners: Colorado Water Conservation Board, Agro Engineering, USFS, Mineral County, City of Creede
The Mineral County Fairgrounds Project

Project Partners: WCRC, US EPA, CDPHE, John Parker, Mineral County,
The Lower Willow Creek Floodplain Project

Project Partners: WCRC, LWCRCo, CDPHE-NPS, CDRMS, Colorado Brownfields Foundation, Colorado Watershed Assembly, Measureable Results Program, City of Creede, Mineral County, Wason Ranch, Creede Resources, Inc.

Project Cost (to date): 1.2 Million
Thank you!