

# Trustees' Proposed Restoration- Based Alternatives for the Molycorp NRDA

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Molycorp Trustees  
March 16, 2006



## Presentation Objective

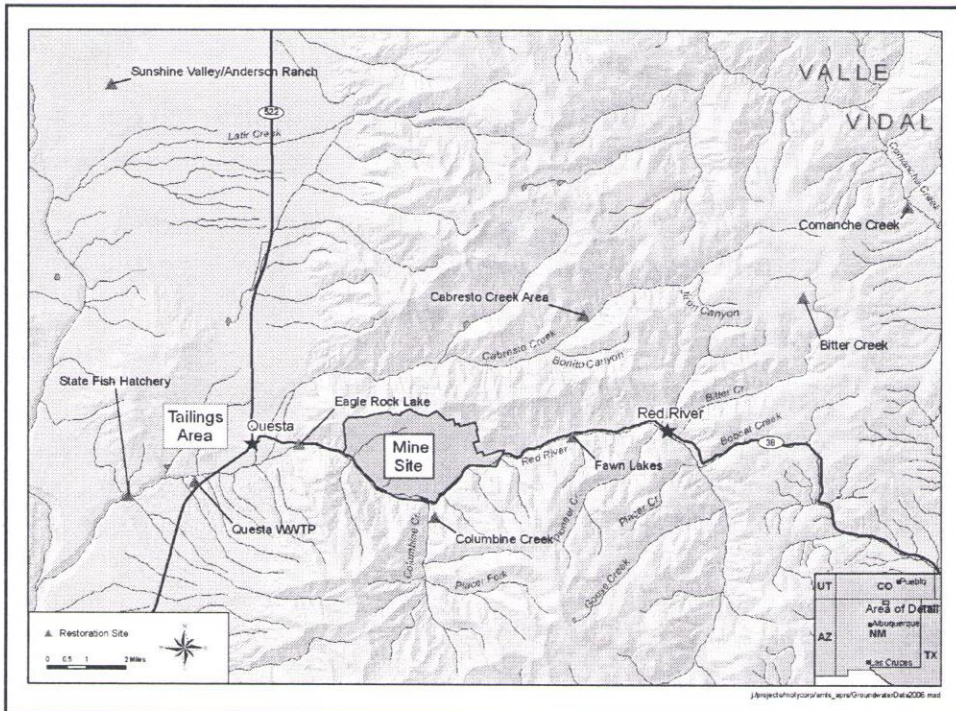
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- ▶ This presentation contains restoration-based alternatives that the Trustees have developed as proposed compensation for the Molycorp NRDA
- ▶ The objective of this presentation is to engage Molycorp in a discussion on packages of restoration alternatives that may comprehensively address all resource categories



# Presentation Overview

- ▶ Project descriptions
  - Aquatic resources
  - Terrestrial resources
  - Groundwater resources
- ▶ Proposed restoration solutions – project suite alternatives



## Project Descriptions

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- ▶ Projects included in proposal were developed during cooperative meetings and field trips with Trustee and Molycorp representatives
- ▶ Projects address aquatic, terrestrial, and groundwater resources
- ▶ Additional information available about projects, including “one-page” project descriptions



## Overview of Projects – Aquatic Resources

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- ▶ Improve existing habitat or access to habitat in the Red River
  - Fish hatchery fish passage enhancement
- ▶ Benefit Rio Grande cutthroat trout in tributaries
  - Cabresto Creek (construct a barrier, reduce competition with brook trout)
  - Bitter Creek (improve habitat for RGCT, construct a barrier)
  - Lower Columbine Creek (improve barriers, remove brown trout, stock with RGCT)
  - Valle Vidal (improve habitat for RGCT)
- ▶ Create new habitat and provide recreational benefit near the village of Questa
  - New habitat at Eagle Rock Lake



## Fish Hatchery Fish Passage Obstruction

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Diversion structure obstructing fish passage



## Fish Hatchery Fish Passage Enhancement

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- ▶ Fish passage in the Red River above the fish hatchery is hampered by a diversion structure
- ▶ Project requirements:
  - Create passageway around diversion structure that would allow fish to traverse the barrier
  - Monitor project for increased fish use of high-quality habitat above hatchery; periodic maintenance
- ▶ Project benefits:
  - Allows spawning brown trout to move up the Red River and access high-quality habitat above the hatchery
  - Restores connectivity of Red River



## Cabresto Creek Cutthroat Trout

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Upper Cabresto Creek cutthroat trout habitat

## Cabresto Creek Rio Grande Cutthroat Trout Protection and Expansion

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- ▶ Upper 6.9 miles of Cabresto Creek contain Rio Grande cutthroat trout at risk of competition from brook trout and genetic introgression with rainbow trout
- ▶ Project requirements:
  - Create fish passage barrier upstream of Bonito Canyon
  - Initial multiple-pass electrofishing for two years to remove or greatly reduce competition with brook trout
  - Maintenance single-pass electrofishing every 3 to 5 years to monitor population status and remove competitors
- ▶ Critical issues:
  - Need to confirm purity of Rio Grande cutthroat trout between Bonito and Jiron canyons (data to be collected and analyzed this Spring); if Rio Grande cutthroat trout are not pure, this project will be eliminated



## Cabresto Creek Rio Grande Cutthroat Trout Protection and Expansion: Project Benefits

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- ▶ Project benefits
  - Protects existing population of cutthroat trout and allows population to expand as competition with brook trout is reduced
  - Confirming genetic purity of this population and securing its status could create a new population for the purpose of state and federal management plans



## Bitter Creek Habitat Improvement

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Example of degraded riparian corridor along Bitter Creek

## Bitter Creek Habitat Improvement

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- ▶ Upper 2.25 miles of Bitter Creek contain Rio Grande cutthroat trout; habitat is degraded and population is not secure
- ▶ Project requirements:
  - Create fish passage barrier below Anchor Mine where creek periodically dries out in summer
  - In-stream and riparian restoration to improve channel and habitat conditions
  - Improved fencing for grazing exclusion (additional information available)
  - Monitoring and periodic maintenance
- ▶ Project benefits:
  - Protects existing population of cutthroat trout
  - Population could increase in response to habitat improvements



## Columbine Creek Cutthroat Trout Enhancement

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View of Columbine Creek



## Columbine Creek Cutthroat Trout Enhancement

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- ▶ Cutthroat trout could be introduced to 1.75 miles of lower Columbine Creek, below existing natural barrier
- ▶ Project requirements:
  - Create fish passage barrier at campground
  - Initial electrofishing for two years to remove or greatly reduce competition with brown trout
  - Introduction of Rio Grande cutthroat trout to this portion of stream
  - Maintenance electrofishing every 3 to 5 years to monitor population status and remove competitors
- ▶ Project benefits:
  - Expands population of cutthroat trout
  - Provides secure buffer for existing population of cutthroat trout in upper Columbine Creek



## Valle Vidal Habitat Improvement

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Riparian exclosures to allow regrowth of vegetation



Post vanes to stabilize stream banks



Example of Comanche Creek restoration work



## Valle Vidal Habitat Improvement

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- ▶ Aquatic habitat in the Valle Vidal is degraded, limiting the carrying capacity for cutthroat trout
- ▶ Project requirements:
  - Protect riparian habitat with exclosures to allow willow re-growth
  - Placement of in-stream structures to stabilize stream banks and reduce sediment loads
  - Reduce sediment loading from nearby roads
  - Proposed treatment of 3.1 – 4.8 miles of Comanche Creek
  - Periodic monitoring and maintenance
- ▶ Project benefits:
  - Improves habitat for aquatic invertebrates, cutthroat trout, and other aquatic biota
  - Benefits terrestrial resources and water quality
  - Leverages state restoration actions in area



## Eagle Rock Lake Habitat Creation

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Excavated area on MolyCorp property that would be used to construct a second lake



## Eagle Rock Lake Habitat Creation

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- ▶ Eagle Rock Lake near Questa is used heavily; additional aquatic habitat would provide important recreational opportunities to the public living near the the mine
- ▶ Project requirements:
  - Transform existing depression into a 2 acre second pond on Molycorp land; create riparian and wetland habitat
  - Stock pond with rainbow trout, following same schedule as existing Eagle Rock Lake
  - Monitoring and maintenance
- ▶ Project benefits:
  - Provides habitat for aquatic invertebrates, rainbow trout, and wildlife associated with pond habitats
  - Provides highly valued recreational resource for Questa
  - Provides aquatic, terrestrial, and groundwater credits



## Project Categories – Terrestrial Resources

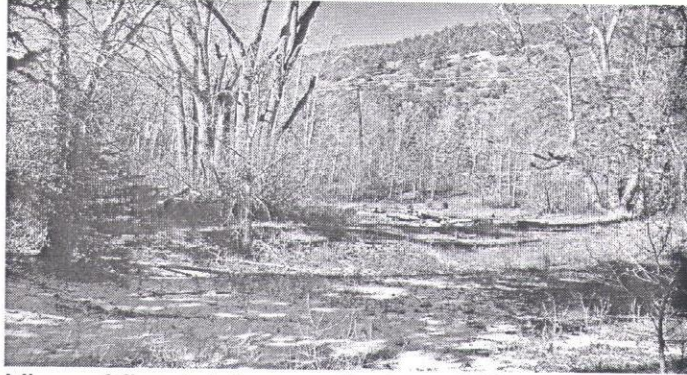
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- ▶ Improve existing habitat
  - Fawn Lakes riparian
  - Sunshine Valley – Anderson Ranch
  - Bitter Creek and Valle Vidal
- ▶ Create new habitat
  - Eagle Rock Lake riparian and wetland habitat
- ▶ All projects require monitoring and maintenance



## Fawn Lakes Riparian Enhancement

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View of floodplain area that would be reconnected to Red River following ramp removal



## Fawn Lakes Riparian Enhancement

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- ▶ Riparian habitat at Fawn Lakes is degraded because of isolation from the floodplain and overgrowth of conifers
- ▶ Project requirements:
  - Remove fill material to allow floodplain to naturally extend to 2.5 acres of riparian area; use fill material to crown entrenched road that contributes excess sediment to the Red River
  - Thin conifers in this area to allow natural regeneration of cottonwoods and other deciduous species
- ▶ Project benefits:
  - Restores natural floodplain processes
  - Benefits riparian vegetation and wildlife
  - Decreases sediment loading to the Red River in this location



## Sunshine Valley/ Anderson Ranch

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View of open-water habitat



## Sunshine Valley/Anderson Ranch Habitat Protection

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- ▶ Anderson Ranch includes an assemblage of valuable bird and wildlife habitats, including locally rare shallow-water wetlands
- ▶ Project requirements:
  - Obtain a conservation easement for the Anderson Ranch
    - 1.3 acres open water; 122 acres wet-marshy; 150-200 acres uplands
  - Develop a monitoring and adaptive management plan to manage wildlife habitats at the site



## Sunshine Valley/Anderson Ranch Habitat Protection – Benefits

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- ▶ Project benefits:
  - Vegetation and wildlife associated with open water, marshy, and upland habitat, including migratory and resident birds
  - Protection of significant amount of uplands (at least 150 acres) in conjunction with open water and marshy habitat greatly enhances the ecological value of all the habitat types
    - For example, marshy habitat could be used for nesting, open water used for raising brood, and uplands used for foraging



## Bitter Creek and Valle Vidal Riparian Habitat Improvement

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- ▶ Bitter Creek and Comanche Creek (Valle Vidal) riparian habitat would be improved if the aquatic restoration projects in these locations are undertaken
- ▶ These projects account for the riparian benefits associated with the aquatic restoration projects described earlier; no additional work is required
- ▶ Project benefits:
  - New vegetation and wildlife habitat
  - Stabilized riparian corridor



## Eagle Rock Lake Riparian and Wetland Habitat Creation

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- ▶ New riparian and wetland habitat would be created together with the second pond at Eagle Rock Lake
- ▶ Project requirements:
  - Create a 1-acre of wetland between the outflow of the second pond and the Red River
  - Create 1 acre of riparian habitat surrounding the new pond and wetland
- ▶ Project benefits:
  - New vegetation and wildlife habitat
  - Increased functional diversity of habitats in the area of Eagle Rock Lake



## Eagle Rock Terrestrial Project

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- ▶ “Simplified” wetland habitat would be created on MolyCorp land at Eagle Rock Lake with associated access improvements
- ▶ Project requirements:
  - Create a 1-acre wetland
  - Enhanced public access
- ▶ Project benefits:
  - New vegetation and wildlife habitat
  - Public access and participation



## Project Categories – Groundwater Resources

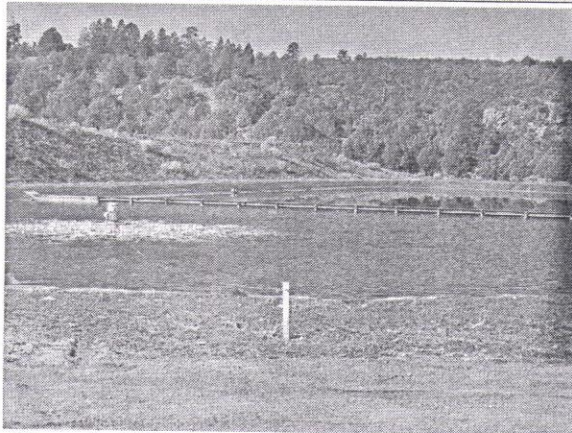
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- ▶ Groundwater quality improvements
  - Upgrade Village of Questa wastewater treatment plant
- ▶ Groundwater benefits associated with restoration projects
  - Eagle Rock Lake wetland
  - Fawn Lake Riparian
  - Sunshine Valley – Anderson Ranch
  - Valle Vidal sediment control
- ▶ While all groundwater injury may not be addressed through these projects, the trustees believe that for purposes of resolving this resource category in a timely manner, these are a reasonable set of restoration actions



## Village of Questa Wastewater Treatment Plant Upgrade

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Questa WWTP Pond



## Village of Questa Wastewater Treatment Plant Upgrade

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- ▶ Project requirements:
  - Upgrade of WWTP to meet 20 mg/L nitrate standard as part of permit discharge requirements
    - Preferred approach is oxic/anoxic process
    - Expansion of aeration, treatment, and settling cells
    - Increased holding capacity
  - Develop a monitoring and adaptive management plan to ensure WWTP meets permit requirements
- ▶ Project benefits:
  - Reduces excess nitrates in alluvial groundwater
  - Improves Red River surface water quality where impacted by alluvial groundwater plume
- ▶ Implementation framework:
  - Molycorp could undertake part or all of project construction



## Groundwater Benefits Associated with Restoration Projects

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- ▶ Because of connections between surface water and groundwater, surface water quality improvements can provide groundwater benefits
- ▶ Project benefits:
  - Eagle Rock Lake wetland – improves water quality of water draining from ponds before re-entering the Red River
  - Fawn Lakes riparian project – reduces local sediment loading into Red River
  - Anderson Ranch conservation easement – reduces water quality impacts associated with unmanaged cattle grazing
  - Valle Vidal sediment control projects – improves water quality of Comanche Creek





## Project Suite Overview

- ▶ Designed to compensate for aquatic, terrestrial, and groundwater injuries
- ▶ Project suites have been reviewed by Trustee staff officials and will be recommended for approval by Trustee management
- ▶ All suites include a project or projects that benefit habitats in and around the Red River
- ▶ All suites include more than one project in each resource category to avoid risk of "all eggs in one basket"



## Project Suite Comparison

	Suite #1	Suite #2	Suite #3
	√	√	√
	√	√	√
	√	√	√
	√	-	-
	-	√ (3.1 mi)	√ (4.2 mi)
	√	Wetland only	-
	-	-	√
	√ (273 ac.)	√ (273 ac.)	√ (323 ac.)
	√	√	√



## Proposed Project Suite #1: Resource Categories Benefited

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	Aquatic credit	Terrestrial credit	Groundwater credit
Fish hatchery fish passage enhancement	√	--	--
Bitter Creek	√	√	--
Columbine Creek	√	--	--
Cabresto Creek	√	--	--
Eagle Rock Lake	√	√	√
Anderson Ranch (150 ac. uplands)	--	√	√
Questa WWTP	--	--	√



## Proposed Project Suite #1: Overview of Benefits

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- ▶ Highest degree of benefit to the town of Questa and the mainstem Red River
  - Fish hatchery fish passage enhancement project benefits the mainstem Red River
  - Columbine Creek provides cutthroat trout benefits closest to the Red River
  - Eagle Rock Lake provides resource and recreational benefits to the village of Questa
- ▶ Significant ecological benefits through improving aquatic and riparian habitat in streams with cutthroat
  - Bitter Creek and Cabresto Creek
- ▶ Significant terrestrial benefit through protecting open water, marshy, and upland habitat at Anderson Ranch (273 acres)
- ▶ Questa WWTP provides important groundwater benefits



## Proposed Project Suite #2: Resource Categories Benefited

	Aquatic credit	Terrestrial credit	Groundwater credit
Fish hatchery fish passage enhancement	√	--	--
Bitter Creek	√	√	--
Cabresto Creek	√	--	--
Valle Vidal (3.1 miles)	√	√	√
Eagle Rock Lake wetland	--	√	√
Anderson Ranch (273 ac.)	--	√	√
Questa WWTP	--	--	√



## Proposed Project Suite #2: Overview of Benefits

- ▶ High degree of benefit to the town of Questa and the mainstem Red River
  - Fish hatchery fish passage enhancement project benefits the mainstem Red River
  - Eagle Rock Lake wetland provides resource and recreational benefits (hiking, birdwatching) to the village of Questa
- ▶ Significant benefits for Rio Grande cutthroat trout
  - Cabresto Creek protects the most number of cutthroat trout
- ▶ Significant ecological benefits through improving aquatic and riparian habitat in streams with cutthroat trout
  - Bitter Creek and 3.1 miles of Valle Vidal
- ▶ Significant terrestrial benefit through protecting open water, marshy, and upland habitat at Anderson Ranch (273 acres)
- ▶ Questa WWTP provides important groundwater benefits



## Proposed Project Suite #3: Resource Categories Benefited

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	Aquatic credit	Terrestrial credit	Groundwater credit
Fish hatchery fish passage enhancement	√	--	--
Bitter Creek	√	√	--
Cabresto Creek	√	--	--
Valle Vidal (4.2 miles)	√	√	√
Fawn Lakes riparian		√	√
Anderson Ranch (323 ac.)	--	√	√
Questa WWTP	--	--	√



## Proposed Project Suite #3: Overview of Benefits

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- ▶ Benefits to the mainstem Red River are focused on resources without significant ancillary recreational benefits
  - Fish hatchery fish passage enhancement project benefits the mainstem Red River
  - Fawn Lakes riparian project benefits the Red River floodplain and riparian corridor
- ▶ Significant benefits for Rio Grande cutthroat trout
  - Cabresto Creek protects the most number of cutthroat trout
- ▶ Significant ecological benefits through improving aquatic and riparian habitat in streams with cutthroat
  - Bitter Creek and 4.2 miles of Valle Vidal
- ▶ Significant terrestrial benefit through protecting open water, marshy, and upland habitat at Anderson Ranch (323 acres)
- ▶ Questa WWTP provides important groundwater benefits



## Conclusion

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- ▶ Multiple restoration project opportunities exist to offset natural resource injuries from the Molycorp Mine
- ▶ Project suites offer a mix of projects that benefit a wide range of resources and would address a broad scope of stakeholder concerns
- ▶ Trustee staff officials have reviewed project suite concepts and view any of the three suites as acceptable

