

RI/FIS Data Collection Overview

February 4, 2005



Chadwick Ecological Consultants, Inc.

5575 S. Sycamore St., Suite 101, Littleton, CO 80120
Ph: (303) 794-5530 Fax: (303) 794-5041 Chadeco@aol.com

Surface Water and Sediment Data Quality Objectives - Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>A. Has the nature and extent of Red River contamination in surface water and sediment exceeding benchmarks, standards, criteria, or reference concentrations been adequately delineated and have sufficient data been collected for the ecological risk assessment</p> <p>If No - Collect additional data</p> <p>If Yes – Continue with B</p>	<p>A. Analyte concentration in reference and Red River surface water at low flow and storm event and in sediment.</p> <p>Promulgated New Mexico Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria (if no promulgated New Mexico Surface Water Standard)</p> <p>Surface Water Screening Criteria (Table 3.1 BERA)</p> <p>Sediment quality benchmarks</p>	<p>A. Surface Water Chemistry</p> <p>Periphyton populations</p> <p>Sediment toxicity</p> <p>Surface Water Toxicity</p> <p>Invertebrate populations</p> <p>Fish Populations</p> <p>Tissue metal concentrations</p>



Surface Water and Sediment Data Quality Objectives – Ecological (Continued)

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>B. For each exposure area of interest, does the sediment and/or surface water pose an unacceptable ecological risk based on a lines of evidence approach using the testable hypotheses from BERA Problem Formulation Table 9.1 and 9.3 for the assessment endpoints for survival and growth of aquatic plants and survival, growth, and reproduction of fish and benthic invertebrates and from Table 9.4 for the assessment endpoints for survival and reproduction of aquatic-dependent bird species and aquatic-dependent mammal species</p> <p>If No – Recommend NFA If Yes – Decision Point</p>	<p>B. Periphyton populations</p> <p>Surface water chemistry</p> <p>Sediment quality benchmarks</p> <p>Sediment chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>NM Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria</p> <p>Risk calculated in EPA's BARA</p>	<p>B. Surface water chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>Periphyton populations</p>



Aquatic Life Data Quality Objectives - Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Analyte concentrations in Red River water and sediment may be taken up by prey aquatic life that could pose a risk to fish birds, and/or mammals through ingestion.</p>	<p>A. Does the aquatic life pose an unacceptable ecological risk based on a lines of evidence approach using the testable hypotheses from BERA Problem Formulation Table 9.3 for the assessment endpoints for survival, growth and reproduction of fish and Table 9.1 for survival and reproduction of aquatic invertebrates?</p> <p>If No – Recommend NFA for prey fish exposure medium</p> <p>If Yes – Decision Point</p>	<p>A. Concentrations of contaminants in the tissues of aquatic plants, benthic macroinvertebrates, and fish (both sites and reference) (i.e., relative to tissue residue benchmarks for selected focal wildlife species).</p> <p>Risk calculated in HHRA's BERA.</p>	<p>A. Surface water chemistry</p> <p>Sediment chemistry</p> <p>Tissue analysis</p>



Fish Data Quality Objectives – Human Health

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Analyte concentrations in Red River water and sediment may be taken up by fish which could pose a risk to human health through ingestion.</p>	<p>A. Do Any analyte concentrations in fish tissue exceed Region 3 RBC's?</p> <p>If No – Recommend NFA for fish exposure medium</p> <p>If Yes – Continue with B</p>	<p>A. Analyte concentrations in fish tissue.</p> <p>Region 3 RBC's for fish tissue.</p>	<p>A. Fillet metal concentrations (mg/kg)</p>
	<p>B. For the exposure area of concern, do contaminant concentrations in fish tissue pose an unacceptable risk to human health?</p> <p>If No – Recommend NFA</p> <p>If Yes – Decision Point</p>	<p>B. Analyte concentrations in fish tissue.</p> <p>Analyte concentrations in reference fish tissue.</p> <p>Risk calculated in EPA's HHRA.</p>	<p>B. Fillet metal concentrations (mg/kg)</p>



Media Sampled

- Fish Populations
- Benthic Invertebrate Populations
- Tissues
 - Fish
 - Benthic Invertebrates
 - Macrophytes/Algae
- Periphyton Populations
- Toxicity Tests
 - Sediment & Water Column
- Habitat
- GSI Study
- Transect Sampling



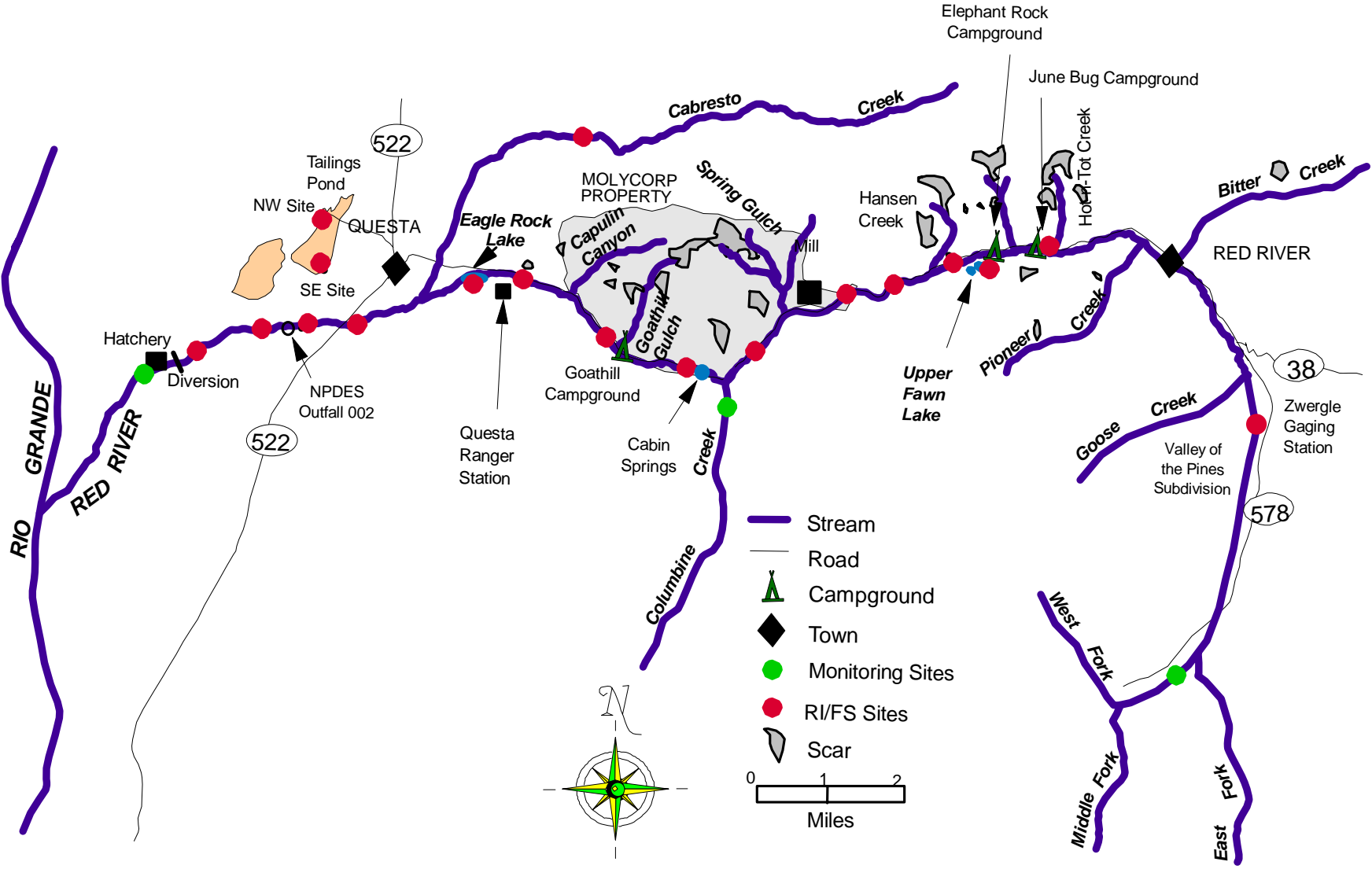
Water Bodies Sampled

- Red River
 - 14 RI/FS and 3 historical monitoring sites
- Cabresto Creek
- Columbine Creek (non RI/FS site)
- Upper Fawn Lake
- Eagle Rock Lake
- Tailings Ponds

(Hatchery)

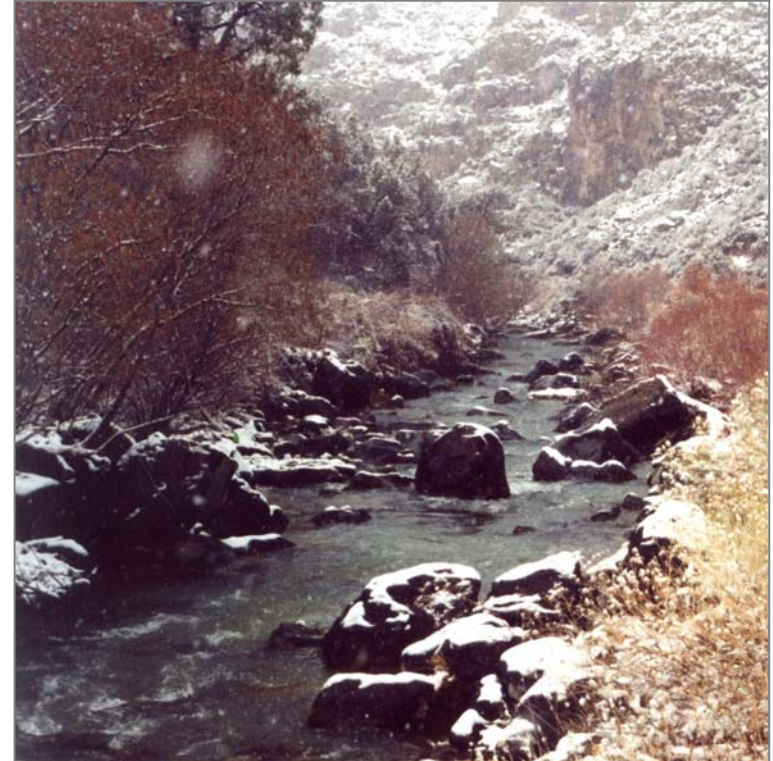


RI/FS Study Area



Time Frame Sampled

- Long-term monitoring
 - 1997-present, Spring and Fall
- RI/FS
 - 2002-2003, Fall, Spring, Fall
 - 2004, Fall



Surface Water and Sediment Data Quality Objectives - Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>A. Has the nature and extent of Red River contamination in surface water and sediment exceeding benchmarks, standards, criteria, or reference concentrations been adequately delineated and have sufficient data been collected for the ecological risk assessment</p> <p>If No - Collect additional data</p> <p>If Yes – Continue with B</p>	<p>A. Analyte concentration in reference and Red River surface water at low flow and storm event and in sediment.</p> <p>Promulgated New Mexico Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria (if no promulgated New Mexico Surface Water Standard)</p> <p>Surface Water Screening Criteria (Table 3.1 BERA)</p> <p>Sediment quality benchmarks</p>	<p>A. Surface Water Chemistry</p> <p>Periphyton populations</p> <p>Sediment toxicity</p> <p>Surface Water Toxicity</p> <p>Invertebrate populations</p> <p>FISH POPULATIONS</p> <p>Tissue metal concentrations</p>



Fish Population Sampling

- Streams:
 - Quantitative population sampling (removal estimate)
 - Representative reach (100 m or longer)
 - Blocked with nets, when possible
 - Electrofished with 1-4 passes (1-pass if no fish collected).
- Lakes:
 - Qualitative population sampling (relative abundance)
 - Gill nets set out overnight
 - Baited minnow traps set out overnight
- Parameters:
 - Fish identified, measured for length and weight, checked for deformities
 - Density (fish/acre, fish/mile), biomass (lbs/acre), species, length-frequency, condition



Fish Population Sampling (fall low flow period)

Sample Date	Stream Sites	Lake/Pond Sites
March 31 - April 3, 1997	10 (monitoring)	0
September 8-11, 1997	10 (monitoring)	0
October 6-9, 1998	10 (monitoring)	0
September 13-17, 1999	12 (monitoring)	0
September 18-22, 2000	12 (monitoring)	0
September 17-21, 2001	12 (monitoring)	0
September 23–October 3, 2002	17 (14 RI/FS and 3 monitoring)	4 (RI/FS)
September 23-October 2, 2003	17 (14 RI/FS and 3 monitoring)	2 (RI/FS)
September 20-29, 2004	19 (3 additional Cabresto sites)	0



Surface Water and Sediment Data Quality Objectives – Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>B. For each exposure area of interest, does the sediment and/or surface water pose an unacceptable ecological risk based on a lines of evidence approach using the testable hypotheses from BERA Problem Formulation Table 9.1 and 9.3 for the assessment endpoints for survival and growth of aquatic plants and survival, growth, and reproduction of fish and benthic invertebrates and from Table 9.4 for the assessment endpoints for survival and reproduction of aquatic-dependent bird species and aquatic-dependent mammal species</p> <p>If No – Recommend NFA If Yes – Decision Point</p>	<p>B. Periphyton populations</p> <p>Surface water chemistry</p> <p>Sediment quality benchmarks</p> <p>Sediment chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>NM Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria</p> <p>Risk calculated in EPA's BARA</p>	<p>B. Surface water chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>INVERTEBRATE POPULATIONS</p> <p>Tissues</p> <p>Periphyton populations</p>



Benthic Invertebrate Population Sampling

- Stream Sites:
 - Quantitative stratified population sampling
 - Five replicate samples with modified Hess sampler (500 μm mesh)
 - Riffle habitat
 - Identified to lowest practical taxonomic level
- Lake Sites:
 - Quantitative population sampling
 - Middle and near-shore sites
 - Five replicate samples with Petite Ponar sampler
 - Identified to lowest practical taxonomic level
- Parameters:
 - Density ($\#/m^2$), species richness, species composition, diversity, # and % sensitive species



Seasonal Benthic Invertebrate Population Sampling

Sample Date	Sites	# Samples
September 9-11, 1997	10 (monitoring)	50
October 6-9, 1998	10 (monitoring)	50
September 13-17, 1999	12 (monitoring)	60
April 3-5, 2000	12 (monitoring)	60
September 18-22, 2000	12 (monitoring)	60
April 2-5, 2001	12 (monitoring)	60
September 17-20, 2001	12 (monitoring)	60
April 1-4, 2002	13 (monitoring)	65
September 23-October 4, 2002	17 stream (14/3) 4 pond/lakes	85 stream 24 pond/lake
March 17-20, 2003 (April 10, 2003)	17 stream (14/3) 4 pond/lakes	85 stream 24 pond/lake
September 23-October 2, 2003	17 stream (14/3) 2 lakes	85 stream 12 pond/lake
March 30-April 1, 2004	16 (monitoring)	80
September 20-28, 2004	16 (monitoring)	80

RI/FS = 315 samples

Monitoring = 625 samples



Surface Water and Sediment Data Quality Objectives – Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>B. For each exposure area of interest, does the sediment and/or surface water pose an unacceptable ecological risk based on a lines of evidence approach using the testable hypotheses from BERA Problem Formulation Table 9.1 and 9.3 for the assessment endpoints for survival and growth of aquatic plants and survival, growth, and reproduction of fish and benthic invertebrates and from Table 9.4 for the assessment endpoints for survival and reproduction of aquatic-dependent bird species and aquatic-dependent mammal species</p> <p>If No – Recommend NFA If Yes – Decision Point</p>	<p>B. Periphyton populations</p> <p>Surface water chemistry</p> <p>Sediment quality benchmarks</p> <p>Sediment chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>NM Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria</p> <p>Risk calculated in EPA's BARA</p>	<p>B. Surface water chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>PERIPHYTON POPULATIONS</p>



Periphyton Population Sampling

- Stream sites only
- Collected by scraping algae from substrates (rocks, mud, wood, metal)
- Identified to lowest practical taxonomic level
- One composite sample per site
- Parameters: species composition, relative abundance



Number of Periphyton Population Samples Collected

Sample Date	# Sites	# Samples
September 23-October 4, 2002	14	14
September 23-October 2, 2003	14	14



Habitat Measurements

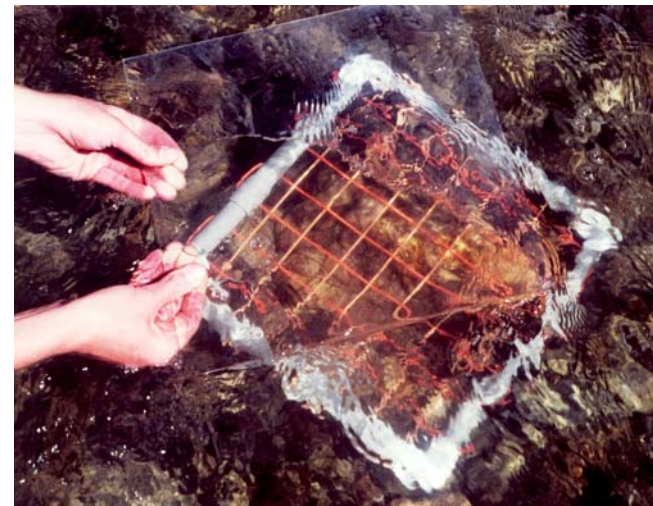
- Not specified in DQO's but provided additional correlates with biological data
- Added in August 2002
- Measured to identify physical parameters which might be structuring biotic communities
- Parameters developed and agreed upon by USEPA, USFWS, NMED, and CEC
- Habitat Assessment based on abbreviated R1/R4 method developed by US Forest Service
- Identifies habitat units, lengths, widths, depths, measurement of embeddedness and % fines
- Only stream sites assessed



Habitat Assessment Generally Conducted with Fish Population Sampling

Sample Date	Number of Sites
September 13-17, 1999	12 (monitoring fish sites)
September 23–October 3, 2002	17 (14 RI/FS and 3 monitoring)
September 23-October 3, 2003	17 (14 RI/FS and 3 monitoring)
March 30-April 1, 2004†	16 (14 RI/FS and 2 monitoring)
September 20-29, 2004	19 (3 additional Cabresto Sites)

† Subset of habitat parameters not affected by shelf ice



Surface Water and Sediment Data Quality Objectives – Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>B. For each exposure area of interest, does the sediment and/or surface water pose an unacceptable ecological risk based on a lines of evidence approach using the testable hypotheses from BERA Problem Formulation Table 9.1 and 9.3 for the assessment endpoints for survival and growth of aquatic plants and survival, growth, and reproduction of fish and benthic invertebrates and from Table 9.4 for the assessment endpoints for survival and reproduction of aquatic-dependent bird species and aquatic-dependent mammal species</p> <p>If No – Recommend NFA If Yes – Decision Point</p>	<p>B. Periphyton populations</p> <p>Surface water chemistry</p> <p>Sediment quality benchmarks</p> <p>Sediment chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>NM Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria</p> <p>Risk calculated in EPA's BARA</p>	<p>B. Surface water chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>TISSUES</p> <p>Periphyton populations</p>



Fish Data Quality Objectives - Human Health

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Analyte concentrations in Red River water and sediment may be taken up by fish which could pose a risk to human health through ingestion.</p>	<p>A. Do Any analyte concentrations in fish tissue exceed Region 3 RBC's?</p> <p>If No – Recommend NFA for fish exposure medium</p> <p>If Yes – Continue with B</p>	<p>A. Analyte concentrations in fish tissue.</p> <p>Region 3 RBC's for fish tissue.</p>	<p>A. FILLET METAL CONCENTRATIONS (mg/kg)</p>
	<p>B. For the exposure area of concern, do contaminant concentrations in fish tissue pose an unacceptable risk to human health?</p> <p>If No – Recommend NFA</p> <p>If Yes – Decision Point</p>	<p>B. Analyte concentrations in fish tissue.</p> <p>Analyte concentrations in reference fish tissue.</p> <p>Risk calculated in EPA's HHRA.</p>	<p>B. FILLET METAL CONCENTRATIONS (mg/kg)</p>



Fish Tissue Sampling

- Stream sites:
 - Multiple fish species (rainbow and brown trout) and sizes (YOY, juvenile, adult)
 - Ecorisk – whole body adult, juvenile, and YOY
 - Human Health – fillet adult trout
 - Collected separately from population studies
 - Fillet and whole body samples for adult trout species (dissected in field)
 - Whole body samples for YOY and juveniles
- Lake sites:
 - Multiple fish species (rainbow and brown trout, white suckers) and sizes (YOY, juvenile, adult)
 - Ecorisk – whole body adult, juvenile, and YOY
 - Human Health – fillet adult trout
 - Mostly collected from mortalities in population studies (gill nets)
 - Fillet and whole body samples for adult trout (dissected in field)
 - Whole body samples for YOY and juveniles

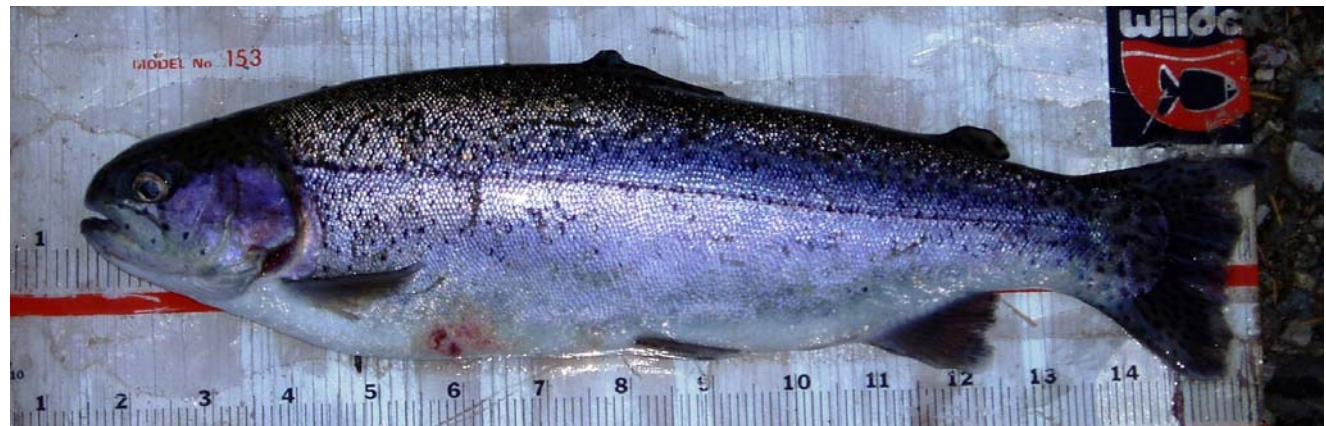


Fish Tissue Metal Parameters (mg/kg)

Aluminum
Antimony
Arsenic
Barium
Beryllium
Boron
Cadmium
Calcium
Chromium
Cobalt

Copper
Iron
Lead
Magnesium
Manganese
Mercury
Molybdenum
Nickel

Potassium
Selenium
Silver
Sodium
Thallium
Vanadium
Zinc



Number of Fish Tissues Samples Collected (Number of Sites Out of a Possible 14 Stream Sites, two lakes, one hatchery)

Sample Date Location	Rainbow Trout	Brown Trout			White Sucker		
	Adult	YOY	Juvenile	Adult	YOY	Juvenile	Adult
9/23–10/3, 2002							
Stream	29 (11)	--	18 (6)	26 (10)	--	--	--
Lake	6 (2)	--	0 (0)	2 (1)	--	6 (2)	--
Hatchery	10 (1)	--	--	--	--	--	--
9/23-10/2, 2003							
Stream	4 (2)	25 (10)	29 (11)	27 (10)	--	--	--
Lake	--	0 (0)	0 (0)	3	3 (1)	6 (2)	6 (2)
Total	49	25	47	58	3	12	6



Benthic Invertebrate Tissue Sampling

- Invertebrates collected with kick net
- Collected from erosional and depositional habitats
- Placed in white pan and sorted on site
- Minimum 5 gram (wet weight) samples
- Composite sample comprised of representative cross-section of available taxa



Invertebrate Tissue Metal Parameters (mg/kg)

Aluminum

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Calcium

Chromium

Cobalt

Copper

Iron

Lead

Magnesium

Manganese

Mercury

Molybdenum

Nickel

Potassium

Selenium

Silver

Sodium

Thallium

Vanadium

Zinc



Number of Benthic Invertebrate Tissue Samples Collected

Sample Date	# Sites	# Samples
April 1-4, 2002	11 stream	11
September 23-October 4, 2002	14 stream 2 lake	16
March 17-20, 2003 (April 10, 2003)	14 stream 2 lake	16
September 23-October 2, 2003	14 stream 2 lake	16

Total = 59 samples



Macrophyte/Algae Tissue Sampling

- Stream sites:
 - Bryophytes (mosses) were collected because of lack of aquatic macrophytes specified in the DQOs.
 - Minimum of 50 g collected from hard substrates and rinsed in stream water
- Lake sites:
 - Filamentous algae collected because aquatic macrophytes and bryophytes not present, except in Eagle Rock Lake in 2003.
 - Minimum of 50 g collected from substrate



Macrophyte/Algae Metal Parameters (mg/kg)

Aluminum
Antimony
Arsenic
Barium
Beryllium
Boron
Cadmium
Calcium
Chromium

Cobalt
Copper
Iron
Lead
Magnesium
Manganese
Mercury
Molybdenum

Nickel
Potassium
Selenium
Silver
Sodium
Thallium
Vanadium
Zinc



Number of Macrophyte /Algae Tissue Samples Collected

Sample Date	# Sites	# Samples
September 23-October 4, 2002	14 stream 2 lake	16
September 23-October 2, 2003	14 stream 2 lake	16



Total = 32 samples

Surface Water and Sediment Data Quality Objectives – Ecological

Problem Statement	Decision Statement	Inputs to the Decision	Analyte Groups
<p>Sources leach or runoff from sources leach to groundwater which migrates to surface water and sediment could pose an ecological risk</p>	<p>B. For each exposure area of interest, does the sediment and/or surface water pose an unacceptable ecological risk based on a lines of evidence approach using the testable hypotheses from BERA Problem Formulation Table 9.1 and 9.3 for the assessment endpoints for survival and growth of aquatic plants and survival, growth, and reproduction of fish and benthic invertebrates and from Table 9.4 for the assessment endpoints for survival and reproduction of aquatic-dependent bird species and aquatic-dependent mammal species</p> <p>If No – Recommend NFA If Yes – Decision Point</p>	<p>B. Periphyton populations</p> <p>Surface water chemistry</p> <p>Sediment quality benchmarks</p> <p>Sediment chemistry</p> <p>Sediment toxicity</p> <p>Surface water toxicity</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>NM Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria</p> <p>Risk calculated in EPA's BARA</p>	<p>B. Surface water chemistry</p> <p>SEDIMENT TOXICITY</p> <p>SURFACE WATER TOXICITY</p> <p>Invertebrate populations</p> <p>Tissues</p> <p>Periphyton populations</p>



Toxicity Tests - Overview

- Chronic and acute bioassays
- Water and Sediment
- Base-flow, snowmelt, storm water, paired with GSI and RI/FS addendum serial dilution



Toxicity Tests - Water

Sample Date	Type	For:	Organism	# Tests
10/26-11/2, 2000*	Chronic	TMDL	<i>C. dubia</i> <i>P. Promelas</i>	6 6
10/1-10/9, 2002	Chronic	RI/FS – Baseflow	<i>C. Dubia</i>	18
10/11-10/18, 2002**	Chronic	RI/FS – Baseflow	<i>C. Dubia</i>	3
4/21-4/28, 2003	Chronic	RI/FS – Snowmelt	<i>C. Dubia</i>	5
7/28-7/30, 2003	Acute	RI/FS – Storm	<i>C. Dubia</i>	3
8/14-8/16, 2003	Acute	RI/FS - Storm	<i>C. Dubia</i>	5
9/5-9/7, 2003	Acute	RI/FS - Storm	<i>C. Dubia</i>	3
9/6-9/8, 2003	Acute	RI/FS - Storm	<i>C. Dubia</i>	5
9/11-9/13, 2003	Acute	RI/FS - Storm	<i>C. Dubia</i>	1
9/23-9/30, 2003	Chronic	RI/FS - Addendum	<i>O. mykiss</i>	4

* Pre RI/FS Joint study with NMED for TMDL

** Confirmatory tests near Outfall 002



Toxicity Tests - Sediment

Sample Date	Type	For	Organism	# Tests
10/31-11/7, 2000*	Chronic	TMDL	<i>Ceriodaphnia dubia</i> <i>Pimephales promelas</i>	6 6
10/4-10/14, 2002**	Chronic	RI/FS	<i>Chironomus tentans</i> <i>Hyalella azteca</i>	10 10
10/18-10/28, 2002**	Chronic	RI/FS	<i>Chironomus tentans</i> <i>Hyalella azteca</i>	8 8
10/14-10/24, 2003**	Chronic	GSI	<i>Chironomus tentans</i> <i>Hyalella azteca</i>	6 6

* Pre RI/FS joint study with NMED for TMDL that used elutriate from sediment pore water

** RI/FS and GSI-related sediment toxicity used bulk sediment toxicity test methods



EPA's GSI Study

- *In situ* 96 hr. toxicity test using indigenous and standard laboratory organisms
- *Drunella* collected by CEC from Zwergle site
- *Hyalella* from laboratory colony



GSI Study

Sample Date	Organisms	Sites	Total Tests
10/6-10/10, 2003	<i>Hyalella azteca</i>	6	30
	<i>Drunella spp.</i>	6	30
9/27-10/1, 2004	<i>Hyalella azteca</i>	6	30
	<i>Drunella spp.</i>	6	30

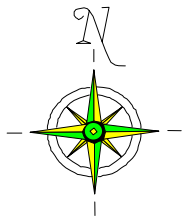


RI/FS Addendum Transect Sampling

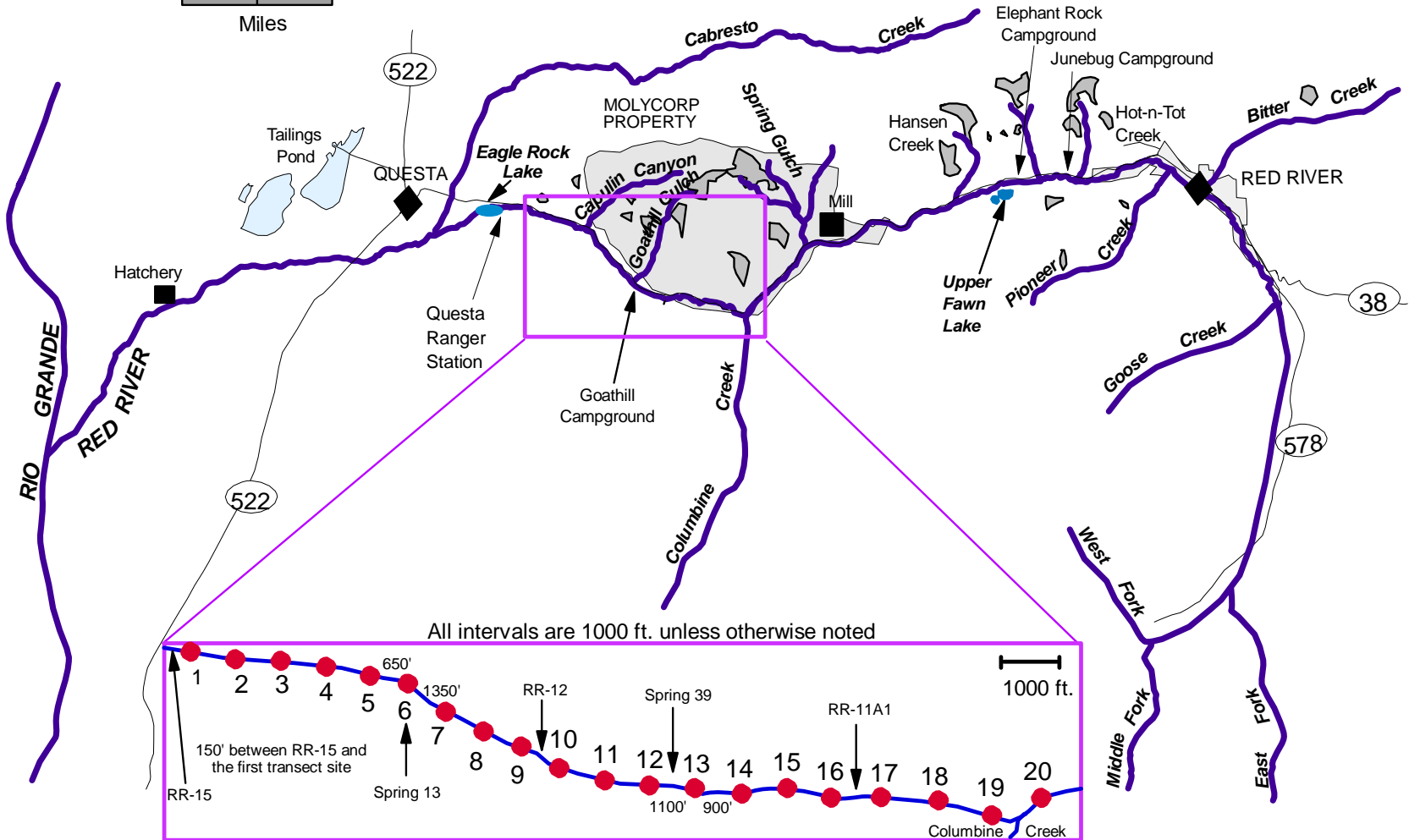
- Twenty transects spaced 1,000 ft apart
- North bank, Center, and South Bank
- RR-15 to upstream of Columbine Creek
- Four additional transects between RR-5 and RR-6
- Benthic invertebrates collected with kick net sampler
- 1-minute timed kick net sample
- EPT counted and identified
- Other invertebrates counted (saved for future identification, if necessary)



Transect Sampling Map



- Sample Sites
 - Stream
 - Road
 - ◆ Town
 - ▭ Scar
- 0 1 2
Miles

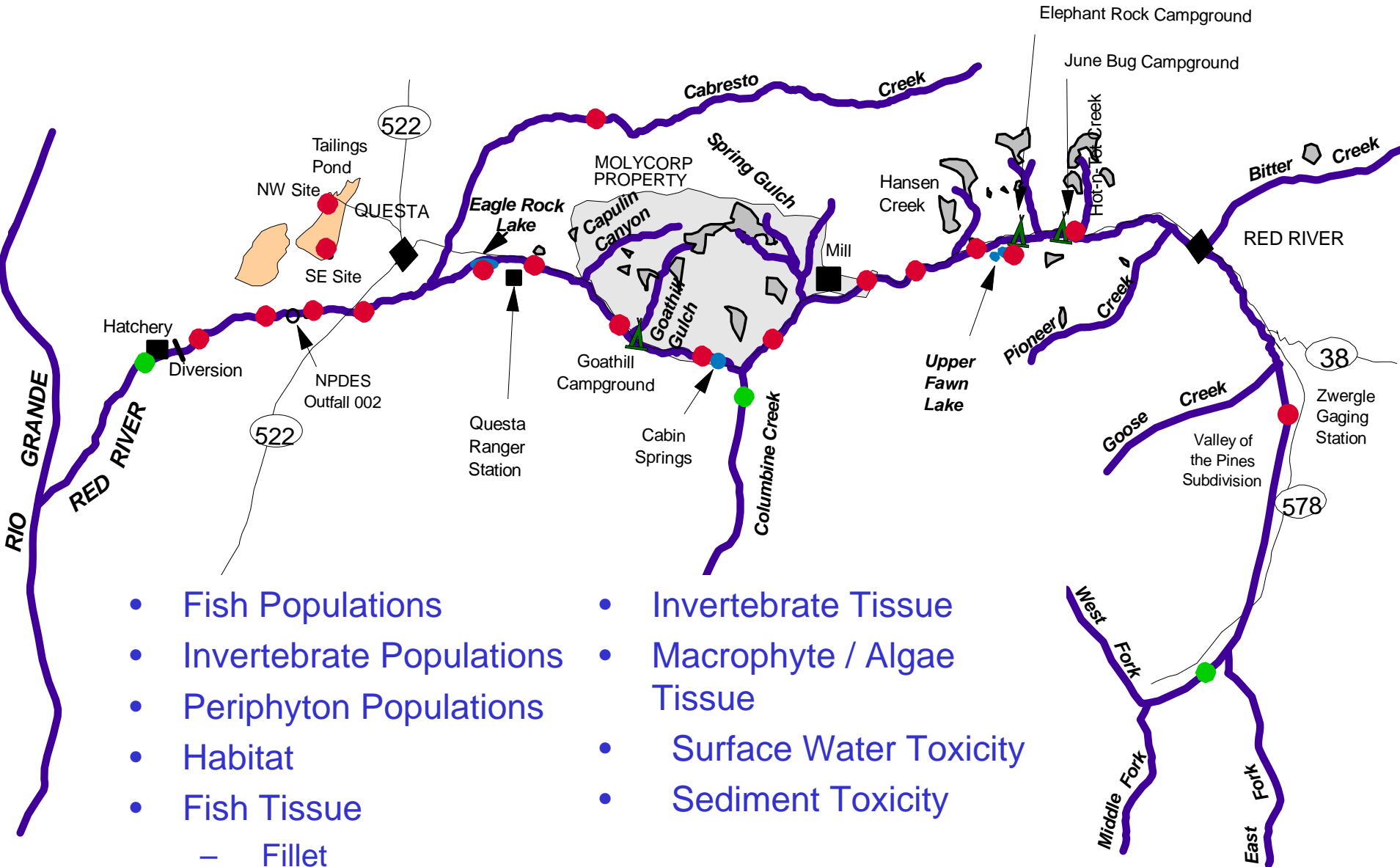


Transect Samples

Sample Date	Sites	Samples
September 21-22, 2004	24	72



How Were The DQO's Met?



- Fish Populations
- Invertebrate Populations
- Periphyton Populations
- Habitat
- Fish Tissue
 - Fillet
 - Whole Body
- Invertebrate Tissue
- Macrophyte / Algae Tissue
- Surface Water Toxicity
- Sediment Toxicity

