

UNITED STATES DISTRICT COURT
DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA,
and
STATE OF NEW MEXICO,
Plaintiffs,
v.
CHEVRON MINING INC.,
Defendant.

Civil Action No. 1:14-cv-783 KBM/CG
Hon. CARMEN E. GARZA
Hon. KAREN B. MOLZEN

PLAINTIFFS' MOTION TO ENTER CONSENT DECREE

The proposed Consent Decree (ECF No. 1-4) between defendant Chevron Mining Inc. and the Plaintiffs -- State of New Mexico and the United States -- is an appropriate resolution of Plaintiffs' claim for natural resource damages, which is the entirety of pending case. Entry of the proposed Decree would conclude this civil action.

For the reasons stated in the memorandum submitted in support of this motion, the Decree meets the legal test in this Circuit for entry of such a decree; accordingly, the Decree should be entered as an order of this Court.

Plaintiffs have considered the issues raised by members of the public during the two comment periods Plaintiffs held concerning the proposed Decree. The comments are summarized and analyzed in the memorandum that accompanies this motion (and also are attached to that memorandum). After considering the comments, Plaintiffs remain convinced that the proposed Decree is a proper resolution of this case.

On August 7, 2015, counsel for the United States (T. Mariani) advised counsel for Chevron Mining (R. Schwartz) that Plaintiffs would be filing this motion seeking entry of the Consent Decree. Counsel for Chevron Mining reported that the company does not oppose this motion and acknowledges that the company already agreed to entry of the Consent Decree “in the form presented without further notice.” *See* Decree Para. 36. However, counsel for Chevron Mining also advises that the company may file a brief that sets out the company’s view on aspects of this Decree.

Finally, counsel for Chevron Mining reports that the company has no objection either to the length of the memorandum to be filed by the United States here or to the length of the overall filing, owing to the exhibits necessary to this motion.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on September 3, 2014, I filed the foregoing PLAINTIFFS' MOTION TO ENTER CONSENT DECREE, MEMORANDUM IN SUPPORT, AND EXHIBITS THERETO electronically through the CM/ECF system, which caused counsel of record to be served by electronic means, as more fully reflected on the Notice of Electronic Filing.

I hereby further certify that on this same date I caused to be served the PLAINTIFFS' MOTION TO ENTER CONSENT DECREE, MEMORANDUM IN SUPPORT, AND EXHIBITS THERETO by U.S. first class mail on the following attorneys, who are not registered participants of the ECF System, at the following addresses:

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**PLAINTIFFS' MEMORANDUM IN SUPPORT OF
MOTION TO ENTER CONSENT DECREE**

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Plaintiffs United States and State of New Mexico, on behalf of their natural resource trustee agencies (*i.e.*, the State Office of Natural Resources Trustee, the Fish and Wildlife Service of the U.S. Department of the Interior (“DOI”), and the Forest Service of the U.S. Department of Agriculture, collectively “the Trustees”) sued Defendant Chevron Mining, Inc. (“CMI”) under the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) for natural resource damages (“NRD”) resulting from Defendant’s mining operations near Questa, in Taos County, New Mexico. The United States and the State of New Mexico (collectively, “the Plaintiffs”) simultaneously filed their Complaint and lodged the proposed Consent Decree with this Court on August 28, 2014 (ECF No. #1-4). Following notice of lodging of the proposed Consent Decree in the Federal Register (*see* 79 Fed. Reg. 53081 (Sept. 5, 2014)), and an extended period for the receipt of public comments, the Plaintiffs now move this Court to enter the proposed Consent Decree as an order of the Court. A line for the Court’s signature appears on page 36 of the proposed Consent Decree.

The mining operations at issue took place on land, but the effects of the mining impacted other natural resources as well, including ground water and a several-mile stretch of the Red River that runs alongside the mining site. The proposed Consent Decree resolves the Trustees’ statutory claim for natural resource damages in exchange for relief specified in the Decree. Specifically, CMI agrees to pay over \$4 million and to transfer ownership of 225 acres to the Trustees. In addition to resolving this claim for natural resource damages against CMI, the federal and state governments are separately negotiating with CMI under other federal and state

authorities to ensure the clean-up (or “remediation”) of threats to human health and the environment posed by those operations, as further described below.

If approved by the Court, the proposed Decree will: (1) produce approximately \$4 million to fund the restoration, replacement or acquisition of natural resources through projects that will be selected after further consultation with the public; (2) recover remaining costs of assessing the harm caused to natural resources (another \$200,000 beyond the \$3.4 million that Defendant has already paid); and (3) transfer into Trustee ownership 225 acres of habitat known as the Anderson Ranch, a property located near the mining site that includes about 100 acres of especially productive marshland that is relatively rare in the area.

Since its lodging with this Court in August of 2014, the proposed Decree has been subjected to two public comment periods, the second one coming after the Trustees made available to the public the Administrative Record File that contains materials the Trustees considered in assessing the natural resource injuries at issue here. After careful consideration of all of the comments received, the Trustees have concluded that none of the public comments warrants a departure from the Decree as originally proposed. The Decree should be entered as an order of the Court, thereby resolving this matter and allowing the natural resource restoration work to begin.

Part I of this memorandum provides an overview of the public comments received. Part II summarizes key elements of the proposed Decree, and Part III recounts the law controlling district court review of proposed consent decrees. Part IV demonstrates why this Decree meets the legal standard in this Circuit for entry by the Court. Part V summarizes and responds to the

major concerns raised by members of the public who commented on the Decree, as does the *Technical Response to Public Comments*. Mem. Exh. A.¹ All the comments received by the United States concerning the proposed Decree are attached as Exhibit B (*Comments Received by U.S. DOJ on Consent Decree proposed for U.S. and New Mexico v. Chevron Mining, Inc., No. 1:14-cv-783, D.N.M.*).

I. OVERVIEW OF COMMENTS RECEIVED

The United States received comments from eleven different individuals or entities on the proposed Decree, some of whom submitted comments both before and after the Trustees made the Administrative Record File available for public inspection. Many of the issues raised by the commenters had already been considered by the Trustees, who reached different conclusions based on their legal and scientific expertise. Moreover, as explained below, many of the comments did not account for the relationship of this natural resource damage case to the enormous remedial clean-up actions required for the mining site (and occurring separately) under other legal authorities of the U.S. Environmental Protection Agency (“EPA”) and the State of New Mexico. The comments received are addressed in more detail in Section V of this memorandum, but generally center on three arguments, which are aimed principally at the Trustees’ analysis of injuries related to surface water:²

¹ This memorandum includes several abbreviations: “CD” for proposed Consent Decree; “CD App.” for Consent Decree Appendix; and “Mem. Exh.” for “Exhibit to Memorandum in Support of Motion to Enter CD.”

² The Trustees found injuries to species and habitat related to surface water, ground water, and land. CD ¶ E. Under the proposed Decree, about \$2.5 million of the \$4 million payment in damages will be used to address injury to groundwater resources, and the balance of that cash payment will be used to address other resources, with the lion’s share directed to redress impacts

- 1) Commenters claim that conditions at and near the mining site are proof that either the Trustees' assessment of the impact to natural resources is much too small or that their assessment could not have been a meaningful one.

These comments fundamentally overlook the fact that the Trustees' claim, resolved by the proposed Decree, is essentially a narrow one, and does not encompass all of the impacts that may have resulted from the mining operations. As such, the relief obtained in this settlement cannot redress all of the impacts of the mining operations. Specifically, the Trustees' claim is separate from the claims held by other federal and state agencies pursuant to which a massive environmental cleanup action is currently being pursued, and separate from any claims that may be held by private citizens pertaining to personal injury or impacts to private property, real or otherwise.

The ongoing and planned cleanup work being addressed by the U.S. EPA and other state agencies will address many of the other impacts of concern to the commenters. Specifically, in 2010, the U.S. EPA, with the concurrence of the New Mexico Environment Department, selected a clean-up plan for the mining site that EPA estimates will cost at least \$500 million.³ The remedy selected by EPA, documented in a Record of Decision ("ROD"), will address both the acid rock drainage from nine enormous waste rock piles and the tailings seepage that

related to contamination of surface water.CD ¶ 6(c). Commenters have focused their specific concerns on impacts to surface water, not ground water.

³ See *Record of Decision for Molycorp Incorporated Site December 20, 2010*, <http://www.epa.gov/region6/6sf/newmexico/molycorp/06-9158694.pdf> (last visited Sept. 3, 2015); U.S. EPA, Chevron Questa Mine site summary (Mem. Exh. D and at "Chevron Questa Mine," <http://www.epa.gov/region6/6sf/6sf-nm.htm> (last visited Sept. 2, 2015)); Mem. Exh. A, Section 3 ("Remediation versus Damage Assessment").

contaminates ground water, surface water and sediment at the site.⁴ This clean-up, overseen by EPA and the State, will contain some of the contamination at its source and will remediate much of the existing contamination by, among other things, extracting and treating groundwater, removing soil contaminated with polychlorinated biphenyl (“PCB”) and molybdenum, and dredging and removing sediment contaminated with metals in Eagle Rock Lake.⁵

Elements of this clean-up work are already underway. In March of 2012, EPA and CMI entered into an Administrative Settlement Agreement and Order on Consent for Removal Actions (“Removal AOC”) under which Chevron excavated and disposed of PCB-contaminated soil at the Mill Area, excavated and disposed of historic tailing spill deposits along the Red River, and removed contaminated sediment from Eagle Rock Lake.⁶ Work is still ongoing under this Removal AOC. In September of 2012, EPA and CMI entered into a second Administrative Settlement Agreement and Order on Consent for Early Design Actions (“Early Design AOC”).⁷ Under the Early Design AOC, CMI is performing extensive design work on groundwater remediation, the tailings facility, and the waste rock piles to determine how best to implement the remedy selected in the

⁴ *Id.* at 1-2.

⁵ *Id.*

⁶ Administrative Settlement Agreement and Order on Consent for Removal Actions, CERCLA Docket No. 06-09-12, filed March 8, 2012, and on file with EPA. Plaintiffs also are placing a copy of this order at the Questa Public Library, just as was done previously with the Administrative Record File.

⁷ Administrative Settlement Agreement and Order on Consent for Early Design Actions, CERCLA Docket No. 06-13-12, filed September 26, 2012, and on file with EPA. Plaintiffs also are placing a copy of this order at the Questa Public Library, just as was done previously with the Administrative Record File.

ROD.⁸ This Early Design AOC has since been amended twice to include more work⁹ and EPA and CMI are currently negotiating additional settlements that would require yet more remedial work at the site to begin soon.

This extensive cleanup work will take years to complete and is a result of statutory claims held by EPA and regulatory and permitting requirements imposed by the State (*i.e.*, the New Mexico Environment Department and the New Mexico Energy, Minerals, and Natural Resources Department). These federal and state authorities are related to, but distinct from, the natural resource damages claim at issue here. The claim the Trustees propose to settle here focuses on securing compensation for injured natural resources and the services that would have been provided by groundwater and ecosystems, or their flora and fauna, but for the injury they have suffered due to releases from the mining operations. This claim, as set out at 42 U.S.C. § 9607(f)(1), is distinct from claims for remedial work at the site and is in no sense punitive in nature. In this Circuit, the Trustees' claim is described as only compensatory of losses to natural resources not addressed through CERCLA clean-up authorities:

The measure and use of damages arising from the release of hazardous waste is restricted to accomplishing CERCLA's essential goals of

⁸ See Early Design AOC, at 14.

⁹ See First Amendment to the Administrative Settlement Agreement and Order on Consent for Early Design Actions, CERCLA Docket No.06-13-12, filed September 30, 2014, on file with EPA; see Second Amendment to the Administrative Settlement Agreement and Order on Consent for Early Design Actions, CERCLA Docket No. 06-13-12, filed November 13, 2014, on file with EPA.

restoration or replacement, while also allowing for damages due to interim loss of use.¹⁰

The commenters' concerns must be evaluated against the focus and extent of the Trustees' claim being resolved here.

The commenters' suggestion that the Trustees' assessment could not have been meaningful stems from a misunderstanding of the process employed. As discussed below in Section V B. and in ¶ 5 of Mem. App. A, the Trustees assessed the extent of this claim by employing a technique known as Resource or Habitat Equivalency Analysis. This assessment method is not only cited in the regulations¹¹, but it is also regularly used in this field, especially in the context of settlement, where the role of the district court is to determine whether a consent decree is fair, reasonable and consistent with the statutory purposes, while also giving deference to the relevant agencies and to CERCLA's policy favoring settlement.¹²

This method involves measuring and estimating natural phenomena over large areas and, as such, necessarily includes some estimation and thus some uncertainty. In light of this uncertainty, as discussed below, the Trustees protected the claim against

¹⁰ *State of New Mexico v. General Electric Co.*, 467 F.3d 1223, 1245 (10th Cir. 2006) [no. 04-2191].

¹¹ See 43 C.F.R. Section 11.83(c) (2) ("valuation methodologies").

¹² *Habitat and Resource Equivalency Analyses in Resource Compensation and Restoration Decision Making*, J.P. Snyder and W.H. Desvousges, *ABA Natural Resources & Environment*, Vol. 28, No. 1, Summer 2013, at 2, citing *United States v. Fort James Operating Co.*, 313 F. Supp. 2d 902, 906–07 (E.D. Wis. 2004).

underestimation by employing assumptions that increased its value within the scope provided by available facts and the reasonable exercise of judgment.

In short, the proposed Decree should not be measured against all impacts and harms that might stem from the mining operation, but only against those appropriate to the claim of the Trustees. Here, the Trustees estimated that injury by well-accepted methods, exercising their judgment with the goal of resisting any shortchanging of the claim, and the Consent Decree's terms would secure fair compensation for that claim.

- 2) Commenters assert that too much time has elapsed during the settlement negotiations, thus invalidating the cost estimates used to justify the adequacy of the settlement.

One of the ways the Trustees tested the adequacy of the proposed settlement was to estimate whether the proceeds of the settlement (*i.e.*, money and real property) could be fashioned into projects that would restore, replace, or acquire the equivalent of natural resources adequate to offset those injuries that fell within the scope of the Trustees' claim. Whether the Trustees ultimately (*i.e.*, after further public comment) implement exactly those projects or somewhat different ones, the Trustees were confident in settling because they concluded that the proceeds of the settlement were adequate to the task.

Commenters claim that the cost estimates were completed as long ago as 2007, or even earlier, and argue that this passage of time should call into question the adequacy of the settlement. This delay does not undermine the sufficiency of the settlement's value for at least three reasons. First, each estimate included a twenty percent cushion for exigencies (above and beyond sums to address administrative and project management costs). Second, and more important, in performing the injury assessment, the Trustees included multiple margins of safety

in favor of adequate resource restoration. For example, notwithstanding any efforts by CMI to reduce contamination of the mining site and the ongoing cleanup of the site due to efforts by EPA and the State agencies, the Trustees estimated the extent of injury based on an assumption of continuing, unrelenting operation (and thus contamination) of site until 2100 – *i.e., for another 85 years*. In fact, CMI's mining operations in more recent years were much different from earlier times: not only did the mine close in the summer of 2014, but EPA-selected clean-up efforts have been underway since at least 2012. These events confirm the very conservative nature of the Trustees assumptions, which tend to overestimate the actual extent of the impacts over time. Third, the Trustees also made little if any reduction in their injury assessment to account for litigation risks. Instead, the Trustees assessed the extent of injury and thus the value of the claim, based on technical judgment alone. For all of these reasons, the Trustees' approach to their assessment was conservative, in favor of protectiveness, and could withstand the test of time.

In short, all of the Trustees' assumptions and approaches were designed to provide a significant margin of safety to the Trustees' estimates of injury, and therefore also to the amount of money needed to secure adequate restoration. Regardless of the date of the cost estimates, these intentionally conservative assumptions assure that the proposed Decree secures adequate compensation for the injuries at issue.

- 3) Commenters object that Trustees did not employ all regulatory tools available to them in assessing injury and forming a plan for the restoration of resources.

Title 43 C.F.R. Part 11 sets forth procedures that the Trustees may, but are not required to, use in assessing natural resource damages. When Trustees elect to use Part 11, they gain a

rebuttable presumption in any litigation of their claim in favor of their assessment of damages.¹³ Some commenters assert that the Trustees' assessment is not reliable unless they comply with each provision of Part 11, even though the commenters acknowledge that the "assessment procedures set forth in [Part 11] . . . are not mandatory."¹⁴ As discussed in Part V of this memorandum, the Trustees did use many of the procedures provided in Part 11 (and will use others in selecting which restoration projects to implement with the proceeds of this settlement), but the Trustees did not need all of them to value their claim for settlement. The only consequence of the Trustees' decision not to use every option available under Part 11 is that the Trustees would not receive a rebuttable presumption in any trial of the damage assessment. However, nothing in Title 43 C.F.R. § 11.10 or elsewhere suggests that the Trustees' decision to exercise their option to use only some of the Part 11 procedures is either deficient or bars a settlement (or even litigation) of the natural resource damages claim.

¹³ Title 43 CFR § 11.10 – Scope and applicability – reads in pertinent part:

. . . This part supplements the procedures established under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR part 300, for the identification, investigation, study, and response to a discharge of oil or release of a hazardous substance, and it provides a procedure by which a natural resource trustee can determine compensation for injuries to natural resources that have not been nor are expected to be addressed by response actions conducted pursuant to the NCP. The assessment procedures set forth in this part are not mandatory. However, they must be used by Federal or State natural resource trustees in order to obtain the rebuttable presumption contained in section 107(f)(2)(C) of CERCLA. This part applies to assessments initiated after the effective date of this final rule.

¹⁴ See, e.g., Mem. Exh. B, comments from: Bill Owen (Oct. 15, 2014), at 3-4.

II. ELEMENTS OF THE DECREE

A. Scope.

The proposed settlement focuses on impacts that have occurred along a stretch of the Red River, extending from the eastern boundary of the mine site to a point north of the Red River Hatchery, about 10.5 miles in all. In considering acceptable settlement proposals and as part of estimating their natural resources claim, the Trustees also analyzed selected areas outside that stretch of riparian habitat—areas that may have suffered discharges of hazardous substances from the handling of tailings that were part of operations at the mine. *See* CD ¶ Q. The settlement also addresses injury to ground water in this same area.

B. Benefits to Plaintiffs.

Under the Decree, CMI is required to transfer to the Trustees the 225-acre Anderson Ranch property. CD ¶ 13 & CD App. D. Defendant also must pay \$4 million into the Court Registry. The Trustees will use that money to complete projects that restore, replace, or acquire the equivalent of natural resources injured by release of contaminants at or near the mining site. CD ¶ 6. The real property and the funds will be used only for projects developed in compliance with the terms of the Decree. Those Decree provisions call for proposed plans for natural resource restoration projects that: (1) identify how the proposed projects will restore, rehabilitate, replace, or acquire the equivalent of injured resources; (2) identify how the funds will be used in projects to offset natural resources injury; and (3) subject any proposed projects to public review and comment prior to final selection and funding of such projects. CD ¶¶ 15, 16. Defendant plays no role in the use of these funds or in the selection of these projects, other than that afforded to the public generally. CD ¶ 7. Defendant also will pay Plaintiffs' remaining

outstanding costs of assessing the mining site for natural resource damages, about \$200,000. CD ¶ 6(a), (b).

C. Benefits to Defendant.

Plaintiffs agree not to sue Defendant any further for natural resource damages at the site, subject to several reservations and re-openers, including Plaintiffs' rights to sue for injunctive or remedial relief (administratively or judicially) – preserving Plaintiffs' ability to issue orders directing Defendant to clean up the site or to seek a court order directing cleanup. CD ¶¶ 18-20.

D. Reviving Plaintiffs' Claim for Damages.

Under the Decree's terms, Plaintiffs regain the right to sue for natural resource damages if Defendant fails to comply with U.S. EPA clean-up requirements and if such failure contributes to a materially different or greater loss of natural resources than that described in the Administrative Record. CD ¶ 21.b. This term safeguards the Trustees' claim by assuring the right to seek additional recovery if, for any reason, Defendant does not timely complete clean-up work and such failure contributes to an additional injury to natural resources. Put differently, this "reopener" provision protects the Trustees' claim against any failure of Defendant to timely perform the clean-up work if such failure materially increases the injuries to natural resources. This provision is consistent with this Circuit's explanation that trustee claims for natural resource damages can be thought of as residual to claims for environmental clean-up.¹⁵ Plaintiffs also may sue Defendant again for natural resource damages if they learn of new information or

¹⁵ *Cf., New Mexico v. General Elec.*, 467 F.3d at 1250 ("... Our view is entirely consistent with the State's most recent characterization of its NRD claim in its reply brief as 'residual to a CERCLA remedy.'")

conditions that cause or contribute to a materially greater or different injury to natural resources than that described in the documents listed in Appendix B to the Consent Decree. CD ¶ 21.a.

III. STANDARD FOR REVIEW AND ENTRY OF A CONSENT DECREE

A. Nature of Consent Decree.

The Supreme Court describes consent decrees as instruments “by which parties settle their disputes without having to bear the financial and other costs of litigating.”¹⁶ Because “a consent decree is a negotiated agreement that is entered as a judgment of the court,” as this Circuit has explained, “[c]onsent decrees, therefore, have characteristics both of contracts and of final judgments on the merits.”¹⁷ “A consent decree is ‘essentially a settlement agreement subject to continued judicial policing.’ It is not a decision on the merits or the achievement of the optimal outcome for all parties, but is the product of negotiation and compromise.”¹⁸

B. Standard of Review.

In *United States v. Colorado*, the Tenth Circuit explained a district court’s obligation in reviewing a consent decree:

Because the issuance of a consent decree places the power of the court behind the compromise struck by the parties, the district court must ensure that the agreement is not illegal, a product of collusion, or against the public interest. The court also has the duty to decide whether the decree is fair, adequate, and reasonable before it is approved.¹⁹

¹⁶ *Local No. 93, Int’l Ass’n of Firefighters v. City of Cleveland*, 478 U.S. 501, 528 (1986).

¹⁷ *Johnson v. Lodge #93 of the Fraternal Order of Police*, 393 F.3d 1096, 1101-02 (10th Cir. 2004) (quoting *Sinclair Oil Corp. v. Scherer*, 7 F.3d 191, 193 (10th Cir.1993)).

¹⁸ *United States v. State of Oregon*, 913 F.2d 576, 580 (9th Cir. 1990) (internal citations omitted).

¹⁹ 937 F.2d 505, 509 (10th Cir. 1991).

C. The Nature of District Court Review.

“Entry of a consent decree is a discretionary exercise of judicial power.”²⁰ Review of a proposed consent decree requires an exercise of discretion rather than a trial-on-the-merits evaluation of whether a better settlement or other resolution could have been secured.²¹ In this Circuit, a court should not “merely *imprimit* [the parties’] decision as though possessed of a clerical rubber stamp[,]” but neither should a court “. . . substitute [its] judgment of what constitutes an appropriate settlement or . . . reform the decree.”²² Nor should a judge in this Circuit “take it upon himself to modify the terms of the proposed settlement decree, nor should he participate in any bargaining for better terms.”²³ In this Circuit, the review is an all-or-nothing decision: The “district court is faced with the option of either approving or denying the decree” such that the agreement stands or falls as a whole.²⁴

²⁰ *United States v. McKinley County, New Mexico*, 941 F. Supp. 1062, 1065 (D.N.M. 1996).

²¹ *United States v. Metro. St. Louis Sewer District*, 952 F.2d 1040, 1044 (8th Cir. 1992) (a “consent decree is not reviewed as a judgment on the merits.”).

²² *United States v. Telluride Co.*, 849 F. Supp. 1400, 1402 (D. Colo. 1994); *see also Bragg v. Robertson*, 83 F. Supp. 2d 713, 717 (S.D. W. Va. 2000), *aff’d*, 248 F.3d 275 (4th Cir. 2001) (“a trial court approving a settlement need not inquire into the precise legal rights of the parties nor reach and resolve the merits of the claims or controversy. In fact, it is precisely the desire to avoid a protracted examination of the parties’ legal rights that underlies entry of consent decrees. Both the parties and the general public benefit from the saving of time and money that results from the voluntary settlement of litigation.”); *accord United States v. North Carolina*, 180 F.3d 574, 581 (4th Cir. 1999); *United States v. Comunidades Unidas Contra la Contaminacion*, 204 F.3d 275, 281 (1st Cir. 2000); *United States v. Cannons Eng’g Corp.*, 899 F.2d 79, 84 (1st Cir. 1990).

²³ *United States v. Colorado*, 937 F.2d 505, 509 (10th Cir. 1991) (citation omitted); *accord United States v. Azko Coatings of America, Inc.*, 949 F.2d 1409, 1435 (6th Cir. 1991) (reviewing court “may not substitute [its] judgment for that of the parties to the decree”).

²⁴ *Id.* at 509.

D. Deferential Standard Favors Approval of a Decree.

“[P]ublic policy strongly encourages the settlement of cases.”²⁵ Moreover, federal courts of appeals recognize that the presumption in favor of settlement “is particularly strong where a consent decree has been negotiated by the Department of Justice on behalf of a federal administrative agency . . . which enjoys substantial expertise in the environmental field.”²⁶ Finally, deference should be granted to the proposed consent decree as an official act of the Attorney General, who has the “exclusive authority and plenary power to control the conduct of litigation in which the United States is involved, unless Congress specifically authorizes an agency to proceed without supervision of the Attorney General.”²⁷ This authority places considerable discretion in the hands of the Attorney General to decide whether, and on what terms, to enter into a settlement.

In summary, if the Decree is fair, adequate and reasonable, and is not illegal, a product of collusion, or against the public interest, it should be approved. Moreover, in determining whether to approve the Decree, this Court should defer to the expertise of the administrative

²⁵ *Ho v. Martin Marietta Corp.*, 845 F.2d 545, 547 n.2 (5th Cir. 1988); *see also Van Bronkhorst v. Safeco Corp.*, 529 F.2d 943, 950 (9th Cir. 1976) (settlement of disputes clearly in the public interest); *United States v. City of Jackson*, 519 F.2d 1148, 1151 (5th Cir. 1975) (a settlement agreement is a “highly useful tool for government agencies, since it maximizes the effectiveness of limited law enforcement resources” by permitting the government to obtain compliance with the law without lengthy litigation).

²⁶ *See Akzo Coatings*, 949 F.2d at 1436 (citing *Cannons Eng’g Corp.*, 899 F.2d at 84); *see also Bragg*, 83 F. Supp. 2d at 717; *In re: Cuyahoga Equip. Corp.*, 980 F.2d 110, 118 (2nd Cir. 1992); *United States v. Charles George Trucking, Inc.*, 34 F.3d 1081, 1085 (1st Cir. 1994).

²⁷ *United States v. Hercules, Inc.*, 961 F.2d 796, 798 (8th Cir. 1992).

agencies in determining settlement terms that are consistent with the statute and in the public interest.

IV. ARGUMENT

A. The Consent Decree is Not Illegal, A Product of Collusion, or Against the Public Interest.

The lodged Decree is not unlawful because the Trustees have alleged a claim under Section 107(a)(4) of CERCLA, 42 U.S.C. § 9607(a)(4), which authorizes them to bring a civil action to recover the costs associated with natural resource damages. The Attorney General has plenary authority over whether, and on what terms, to enter into a settlement of a claim held by the United States.²⁸ Moreover, public officials of the United States are entitled to a presumption that their actions and decisions are not illegal or a product of collusion.²⁹

The Decree is not a product of collusion or against the public interest. Plaintiffs, through the agencies identified in the Complaint and the Decree, are authorized to act as Trustees for the natural resources that fall within their purview. *See* CD ¶¶ G, H for United States and CD ¶¶ I, J for the State of New Mexico. The Trustees' experience and expertise make them well-suited for this work. For example, the core mission of the U.S. DOI's Fish and Wildlife Service includes conservation and restoration of wildlife habitat, management of migratory birds, and management of ecosystems to sustain fish and wildlife.³⁰ As for the Defendant, CMI is equally well-suited to resolve this claim, as it is the operator and legal successor-by-merger to the owner

²⁸ *See Hercules*, 961 F.2d at 798.

²⁹ *See McKinley*, 941 F. Supp. at 1066 (citing *United States v. Chem. Found. Inc.*, 272 U.S. 1, 14-15 (1926)).

³⁰ *See Fish and Wildlife Service: Creation, Authority, and Functions*; <http://www.fws.gov/policy/022fw1.html> (last visited Aug. 6, 2015).

of the mine entities and thus a proper target of this action. CD ¶ 3(t). Together, these are the proper parties to resolve this claim.

Moreover, both sides expended significant resources on this settlement effort—including in-house personnel and consulting contractors with special skills and knowledge. CD ¶ 6 and Mem. Exh. C, Chevron Letter to the United States, October 3, 2014.³¹ The parties formed the settlement proposed here without collusion but instead through extensive bargaining. The parties were represented by personnel with relevant expertise and were informed by the Administrative Record File, which includes studies and data specific to the conditions at the mining site, general information on natural resources injury, and information related to possible approaches to restoration. As such, the Consent Decree is not illegal, a product of collusion, or against the public interest.

B. The Consent Decree is Fair.

Determining whether a consent decree is fair involves both procedural and substantive components.³² To measure procedural fairness, a court should gauge the candor, openness, and bargaining balance of the negotiations that led to the consent decree.³³ Substantive fairness

³¹ Since Chevron is a party and already consented to entry of the Decree without further notice (CD ¶ 36), the Plaintiffs do not consider the public comment period the proper forum for remarks by the Company. The Company did submit this letter during the comment period, so the United States includes it as a matter of completeness.

³² See *Cannons*, 899 F.2d at 86; *Telluride*, 849 F. Supp. at 1402; *United States v. Weiss*, No. 11-CV002244-RM-MJW, 2013 WL 5937912, at *2-3 (D. Colo. Nov. 6, 2013).

³³ *Id.* See also *United States v. Hooker Chem. & Plastics Corp.*, 607 F. Supp. 1052, 1057 (W.D. N.Y.) (court should look to such factors as “the good faith efforts of the negotiators, the opinions of counsel, and the possible risks involved in litigation if the settlement is not approved”) *aff’d*, 776 F.2d 410 (2d Cir. 1985); *United States v. Rohm & Haas Co.*, 721 F. Supp. 666, 680-81

flows from procedural fairness.³⁴ “Substantive fairness ‘introduces into the equation concepts of corrective justice and accountability: a party should bear the cost of harm for which it is legally responsible.’”³⁵ Substantive fairness concerns factors such as “the strength of the plaintiff’s case, the good faith efforts of the negotiators, the opinions of counsel, and the possible risks involved in the litigation if the settlement is not approved.”³⁶

The lodged Decree is substantively fair. This settlement secures the Trustees’ principal goal: amassing funds and ecologically productive property sufficient to offset the Trustees’ measure of the natural resource injury legally attributable to CMI. Similarly, the settlement would give Defendant what is likely its principal desire here: resolution of the Trustees’ claim without litigation and protection against a further suit for natural resource damages (though, as noted in Section II, above, the Decree does allow Plaintiffs to renew just such a claim in certain circumstances).

Under the Decree, CMI will pay Plaintiffs more than \$4 million, transfer ownership of a 225-acre parcel, and live with a small-but-real possibility of further suit for natural resource damages. Plaintiffs likewise made some concessions. Plaintiffs no doubt would have preferred an even larger cash recovery as a bigger hedge against uncertainty. Better still for Plaintiffs would have been a defendant that, rather than paying a defined amount for restoration projects,

(D.N.J. 1989) (court should consider whether the settlement reflects a “reasonable compromise”).

³⁴ *Telluride*, 849 F. Supp. at 1402.

³⁵ *United States v. ASARCO, Inc.*, 814 F. Supp. 951, 954 (D. Colo. 1993) (quoting *Cannons*, 899 F. 2d at 87); *see also Weiss*, 2013 WL 5937912 at *2.

³⁶ *Telluride*, 849 F. Supp. at 1402 (internal quotations omitted).

had agreed to perform projects that Plaintiffs select, thus carrying all the risks of any cost overrun or other issue that might arise in implementing those projects. But Plaintiffs' failure to secure the best imaginable result or to force the worst imaginable one on Defendant is not the test for whether a court should enter a consent decree. Here, as described in more detail below and in the *Technical Response to Public Comments* (Mem. Exh. A at ¶ 5), the Trustees used standard methods for assessing the extent of the impacts and the amount of money or other assets needed to restore, repair, or acquire natural resources that would offset those impacts.

The substantive fairness of the lodged Decree is perhaps the best measure of the procedural fairness of the settlement. Nevertheless, as to procedural fairness, the settlement was reached through arms-length negotiations that took several years to complete. Representing the United States were experienced environmental attorneys from the U.S. Department of Justice, the U.S. Department of the Interior, and the U.S. Department of Agriculture, as well as experienced technical enforcement staff. The State of New Mexico was similarly represented by a team of experienced staff, including an environmental attorney from the New Mexico Attorney General's Office and technical enforcement staff and managers. CMI was also represented by a team of experienced environmental personnel, including in-house counsel and outside counsel, environmental and technical experts, and consulting experts.

Once the terms of the proposed Decree were fully negotiated between the parties, the resulting Decree was reviewed and approved by: (1) responsible officers and directors of CMI; (2) senior management of the State Office of Natural Resources Trustee, the Fish and Wildlife Service of the U.S. Department of the Interior, and the Forest Service of the U.S. Department of

Agriculture, who had not participated in the settlement negotiations; (3) the Assistant Attorney General of the Environment and Natural Resources Division of the U.S. Department of Justice; and (4) the New Mexico Attorney General's Office. For all these reasons, the lodged Decree is procedurally fair.

C. The Consent Decree is Adequate and Reasonable.

Four factors determine whether a consent decree is adequate and reasonable. First and most importantly, a court must consider “whether the consent decree is in the public interest and upholds the objectives of the [relevant statute].”³⁷ Other relevant factors are “(2) whether the [consent] decree is technically adequate to accomplish the goal of cleaning the environment, (3) whether it will sufficiently compensate the public for the costs of remedial measures, and (4) whether it reflects the relative strength or weakness of the government's case against the environmental offender.”³⁸ “The Court need not assess whether the government made the best possible settlement.”³⁹ The underlying purpose of the Court in making these inquiries is to determine whether the consent decree adequately protects the public interest.”⁴⁰

Plaintiffs' complaint alleged that CMI is liable for natural resource damages under Section 107(a) of CERCLA. Complaint, ECF No. 1, at ¶ 21. The proposed settlement adequately resolves (and remains within the scope of) the claim pled, by requiring Defendant to pay more than \$4 million for injuries to those natural resources. CD ¶ 6. The additional

³⁷ *Telluride*, 849 F. Supp. at 1402.

³⁸ *Id.* (citing *Cannons*, 899 F.2d at 89-90). *See also Azko Coatings*, 949 F.2d at 1436.

³⁹ *United States v. Union Elec. Co.*, 934 F. Supp. 324, 331 (E.D. Mo. 1996) (citations omitted), *aff'd*, 132 F.3d 422 (8th Cir. 1997).

⁴⁰ *Id.*

requirement for Defendant to transfer 225 acres known as Anderson Ranch to the Trustees is an alternative form of payment in lieu of cash. *Id.* at ¶ 13-14. The total value of the recovery is commensurate with the federal and state Trustees' assessment of the injuries and the estimated costs to restore, replace, or acquire the equivalent of the injured natural resources: "The settlement proceeds should produce restoration, replacement, or acquisition of natural resources that corresponds well to the extent of injury of such resources." Mem. Exh. A, page 14 ("Conclusion"). Defendants will also pay the Trustees' remaining unpaid assessment costs, which are recoverable pursuant to CERCLA Section 107(a)(4)(C). *Id.* at ¶ 5. Thus, the settlement adequately and reasonably compensates for the alleged injuries to natural resources.

The lodged Decree also satisfies the other three *Telluride* criteria. First, the Decree is technically adequate to comply with the requirements at issue because it is premised on the technical judgment of the Trustees, following an in-depth assessment of the extent of the impacts. Second, the Decree sufficiently compensates the public by funding the restoration projects, yet to be selected. Third, the settlement reflects the strengths of the United States' case, because the settlement amount is premised on an assessment of the natural resources injury that the Trustees calculated, using conservative assumptions favorable to the Trustees.

For all of these reasons, the Decree is a fair, adequate, and reasonable result.

V. NONE OF THE PUBLIC COMMENTS WARRANT REJECTION OF THE DECREE

A. Response to Procedural Comments.

After making the Consent Decree available for inspection and inviting comments from the public, the United States ultimately received written comments from eleven different entities

or individuals. *See* 79 Fed. Reg. 53081 (September 5, 2014); all comments received are provided as Exhibit B to this Memorandum. Some of the comments received address the merits of the Decree, but many seek either more time to evaluate the merits of the Decree, more information about the basis for the Decree, or more explanation about some terms of the Decree.⁴¹ Some commenters also seek a public hearing, other additional process, or court orders, but without citation to any supporting legal authority.

Plaintiffs have addressed these procedural requests in three ways. First, Plaintiffs provided access to the Trustees' entire Administrative Record File for this matter by making it available for inspection and copying at the Questa, New Mexico public library. The file includes not only all the materials comprising the administrative record, but also information related to cost projections and other material relevant to the Trustees' analysis of this matter. Second, the Plaintiffs sent an individual notice to each commenter informing them of the availability of the Administrative Record File. Third, the Plaintiffs re-opened the comment period, thereby extending it for another thirty days. 79 Fed. Reg. 63941 (Oct. 27, 2014).

A variety of other procedural requests or comments are also made by the commenters, none of which warrant rejection of the Decree. Five such requests are described here. First, one commenter seeks judicial approval of some portions of the Decree, but not all. Specifically, this commenter recommended approval of the aspects of the Decree pertaining to ground water

⁴¹ *See, e.g.*, Mem. Exh. B, comments from: Bill Owen (Sept. 19, 2014), James P. Morgan, Ph.D. (Sept. 26, 2014), Stephen Schmidt (Sept. 28, 2014), Nicole de Jurenev (Sept. 29, 2014), H. William Adkison, M.D. (Oct. 2, 2014), Scott J. Moore (Sept. 30, 2014), Taos County Administration (Oct. 1 2014).

impacts, but not those pertaining to surface water impacts.⁴² The law of this Circuit expressly bars such relief: “While the court may either approve or deny the issuance of a consent decree, generally it is not entitled to change the terms of the agreement stipulated to by the parties.”⁴³

Second, a commenter seeks an order directing the parties to assess damages for the last ten years and damage into the future.⁴⁴ Even if the district court could substitute its judgment or modify the terms of settlement,⁴⁵ such an order is unnecessary as the Trustees’ damage estimates already include the last ten years (and further back, to 1981) as well as the next 85 (*i.e.*, through the year 2100). Mem. Exh. A, at ¶ 5.a.

Third, a commenter seeks “a re-evaluation of the damages” and “new negotiations.”⁴⁶ The parties already have negotiated for some years and the Trustees have carefully evaluated their claim. This evaluation is explained in more detail in the *Technical Response to Public Comments* (Mem. Exh. A). Further evaluation or negotiations are not needed and would not produce a different result.

⁴² Mem. Exh. B, William L. Owen (Oct. 15, 2014) (reject “the \$1.5 million portion of the decree” and delay any settlement as to that portion of the proposed decree until Plaintiffs’ trustee agencies take more “public input, develop a restoration plan (with budget) and either negotiate adequate compensation with defendant or litigate the matter.” at p. 8).

⁴³ *United States v. Colorado*, 937 F.2d at 509.

⁴⁴ Taos County Administration (Nov. 26, 2014) (order reevaluation of damages that “must include damage that occurred during the last 10 years and that will occur in the future” at p. 2);

⁴⁵ *United States v. Colorado*, 937 F.2d at 509; *Telluride*, 849 F. Supp. at 1402.

⁴⁶ Mem. Exh. B, comment from Amigos Bravos (Oct. 6, 2014) (Plaintiffs should be directed to “. . . reevaluate damages . . . enter into new negotiations” at p. 3).

Fourth, one commenter asks the court to order “the process of damage evaluation be opened to meaningful public input.”⁴⁷ Plaintiffs’ production of the Administrative Record File, followed by a second comment period, has already afforded meaningful public input. In addition, the Decree’s terms provide for additional public comment on any restoration project the Trustees propose to implement with the proceeds of the settlement. CD ¶ 16.

Finally, some commenters seek more accessible information (or analysis of the information) that is the basis of the Trustees’ claim for aquatic injury.⁴⁸ In response, as noted, Plaintiffs provided the public the Administrative Record File for this matter, which is organized by subject matter, listing each document title within each subject matter. Provided in electronic form for ease of access, the file allows a user to examine each document in full merely by clicking on its title. This Memorandum, together with Exhibit A, explain further the analysis underlying the settlement. As they did with the Administrative Record File, Plaintiffs have provided this Memorandum and its Exhibits to the Questa Public Library and so notified the commenters.

B. Response to Substantive Comments.

After consideration of the public comments, Plaintiffs and their Trustee agencies remain convinced that entry of the Decree remains the proper course. The most significant comments

⁴⁷ Mem Exh. B, comment from Taos County Administration (Nov. 26, 2014) (“comment period for a matter of this magnitude and complexity has been inadequate” and asks court to order “that the process of damage evaluation be opened to meaningful public input.” at p. 2).

⁴⁸ See, e.g., Mem. Exh. B, comments from: James P. Morgan (Sept. 26, 2014) (“no easily accessible information in the decree that details how the settlement terms were determined”); Amigos Bravos (Oct. 6, 2014) (seeks a “comprehensive analysis of the evidence gathered by the Trustees to make a claim for damages to the aquatic habitat.” at p. 3).

are summarized and discussed below. For a more detailed discussion, especially of some of the more technical points made by the commenters, see Mem. Exh. A.

*Comment: The Decree does not address all of the natural resource injuries or other environmental impacts associated with the mining operations. Examples of other injuries include impacts to livestock, cropland, and to other natural resources such the air.*⁴⁹

The Trustees naturally focused on identifying only those injuries to resources that fell within the scope of their statutory claim for natural resource damages. In so doing, the Trustees evaluated a wide range of types of possible injuries (including those mentioned by the commenter), but some such injuries were necessarily excluded from the analysis. For example, the Trustees did not quantify an injury where the resources involved fell outside the scope of the Trustees' claim (*e.g.*, livestock of private parties). To the extent there may be other such impacts associated with the mining activities, the Plaintiffs (and the Consent Decree) take no position regarding their extent or whether others have claims for them.

Second, certain years in which impacts may have occurred were excluded from the Trustees' analysis for statutory reasons. Specifically, CERCLA precludes any recovery "where such damages and the release of a hazardous substance from which such damages resulted have occurred wholly before December 11, 1980." 42 U.S.C. § 9607(f)(1). Pursuant to this provision, the Trustees excluded from the assessment any impacts that occurred wholly prior to December 11, 1980. However, the Trustees included all impacts that occurred after this date,

⁴⁹ See, *e.g.*, Mem. Exh. B, comments from: William L. Owen (Sept. 18, 2014) ("There is no specific mention of injury to air quality . . ."); Amigos Bravos (Nov. 25, 2014) ("None of the \$1.5 million will go towards compensating farmers, fisherman, or recreationalists for the loss of income from natural resource damages caused by hazardous substance releases from the mine.")

even if the impact stemmed from releases that may have occurred prior to the cut-off date.⁵⁰

Moreover, the Trustees conservatively assumed that the impacts upon which the damage assessment was based would continue into the future (until 2100) unabated, regardless of the clean-up efforts underway or other changes (such as the mine's closure in 2014) that might diminish future impacts to natural resources.

Third, some of the impacts that commenters characterize as overlooked were actually implicitly included by the Trustees as part of other injuries. For example, the loss of recreational opportunities associated with angling were implicitly included in the Trustees' assessment of injury to aquatic resources. Rather than directly quantify these recreational losses, the Trustees determined that, because the aquatic injury claim was based heavily on losses to the fishery, restoration projects aimed at increasing fish biomass would simultaneously provide enhanced recreational benefits.⁵¹

Perhaps most importantly, as discussed above, this Decree and the natural resource damage claim it would resolve is wholly separate from the massive environmental clean-up work selected for the mining site by EPA, which is overseeing the environmental remediation.

⁵⁰ See *In re Acushnet River & New Bedford Harbor Proceedings re Alleged PCB Pollution*, 716 F. Supp. 676, 679-687 (D. Mass. 1989) (holding that although the government cannot recover for damages occurring prior to enactment, it can recover for the entirety of post-enactment damages, including the portion of post-enactment damages caused by pre-enactment releases); accord *Aetna Cas. & Sur. Co. v. Pintlar Corp.*, 948 F.2d 1507, 1515-1516 (9th Cir. 1991); *Coeur D'Alene Tribe v. Asarco Inc.*, 280 F. Supp. 2d 1094, 1113-14 (D. Idaho 2003) *modified in part sub nom. United States v. Asarco Inc.*, 471 F. Supp. 2d 1063 (D. Idaho 2005) (holding that passive migration (i.e., "re-release") of contaminants released prior to enactment may result in post-enactment release; moreover, "even if the releases did not occur post-enactment, the Defendants would still be liable as the damages were quantified post-enactment.").

⁵¹ See Mem. Exh. A, Section 7 ("Evaluation of other Resources of Concern to Commenters").

Together with the New Mexico Environment Department and the New Mexico Energy, Minerals, and Natural Resources Department, EPA is supervising CMI's performance under statutory authorities related to, but distinct from, the natural resource damages claim advanced here.

Although this cleanup work may well reduce the injury to natural resources, the Trustees nonetheless estimated injury as if remediation of the mining operations would not take effect until 2100, thereby reducing the chance of underestimating the extent of injury they used in bargaining with Defendant for these settlement terms. Mem. Exh. A, Section 5.a. In short, although the Trustees did not assess impact outside their authorities, they fully and conservatively assessed the impacts that fell within their claim for natural resource damages.

Comment: It is impossible to tell how Plaintiffs came to the settlement terms they did, which appear to be insufficient in any case. Without more detail, it is not clear whether Plaintiffs reached correct conclusions or whether those conclusions are supported by the documents released to the public.⁵²

⁵² See, e.g., Mem. Exh. B, Comments by: James P. Morgan (Sept. 26, 2014) ("There does not seem to be a relationship to the pre-assessment screening and determinations of the detailed environmental damage done by the MolyCorp Inc. mining operations and the settlement terms. . . [The Court should d]elay the public comment period until such time that sufficient and understandable information is presented by the Trustees which will allow the public to properly review the matter"); Stephen Schmidt (Sept. 28, 2014) ("I would like to see the comment period expanded to allow others to become aware of this settlement and to look into how this was determined."); Nicole de Jurenev (Sept. 29, 2014) (" . . . extend the comment period so the methodology used for the settlement may be properly reviewed"); Scott Moore (Sept. 30, 2014) (describing proposed settlement as "a woefully inadequate amount of money that Chevron is left responsible for." [sic]); Amigos Bravos (Oct. 6, 2014) ("Consent Order released to the public on September 5th [2014] does not detail how the conclusions presented in the document were generated." at p.2); Taos County Administrator (Nov. 26, 2014) (" . . . defies common sense to place the settlement value at \$7.6 million." at p. 1).

First, although the Decree does not reveal all the particulars of the settlement discussions that produced it, it contains numerous provisions that provide information about the Trustees' approach to assessing their claim. *See, e.g.*, CD ¶ E (describing the Trustees' review of historical studies to assess extent of injury to natural resources); ¶ P (describing an investigation by the Trustees of injuries related to releases from hazardous and non-hazardous substances from mining operations); ¶ Q (describing the Trustees' search for impacts to natural resources where historical and other information indicated such impacts would be found); ¶ R (acknowledging that significant improvement in environmental conditions at the mining site have been made, but noting that conservative assumptions were made to ensure adequate compensation, such as assuming that the release of hazardous and non-hazardous substances will continue long into the future); and ¶ 5 (requiring CMI's expenditure of several million dollars to assure robust examination of extent of claim).

Second, Plaintiffs' Trustee agencies made the Administrative Record File available to the public, organized by type of study (*e.g.*, preliminary, clean-up); type of injury (groundwater, surface water, terrestrial); and topics pertinent to resource restoration (*e.g.*, purpose of, need for, alternative approaches). This detailed, extensive, organized File responds directly to the commenters' request for additional information about the analysis underlying the settlement.

Third, the Trustees employed authorized approaches to assess the extent of injury and the assets that would be necessary to compensate for that injury. Using dozens of

study documents specific to the area of the mining site as well as other secondary source material, the Trustees used Resource and Habitat Equivalency Analyses to estimate the extent of injury to natural resources that flowed from Defendant's activities. These methods are standard approaches that are approved by the applicable regulations,⁵³ and have been upheld by federal courts.⁵⁴ Using these techniques, the Trustees estimated the extent of injury that has been or will be suffered by a resource over time, and in units that the Trustees can price and attempt to replace. Mem. Exh. A, Section 5. After using these methods to assess the extent of the impact to natural resources, the Trustees examined the costs of sample (or proxy) projects to estimate how much compensation would be required from the Defendant to fund combinations of projects sufficient to offset the loss. Mem. Exh. A, Sections 8.a ("Evaluation of Proxy Restoration Projects") and 8.d ("Estimation of Future Restoration Planning Costs"). By comparing the settlement value to this estimated cost of a combination of proxy projects, the Trustees determined that they were securing a fair settlement value for the claim. Together, the cash and real property that would be secured under the Decree will produce a combination of

⁵³ See 43 C.F.R. § 11.84 (c)(2) (listing Resource and Habitat Equivalency Analyses as approved valuation methodologies).

⁵⁴ See *United States v. Great Lakes Dredge & Dock Co.*, 259 F.3d 1300, 1305 (11th Cir. 2001) (upholding the use of a Habitat Equivalency Analysis as satisfying the evidentiary requirements of *Daubert*); *United States v. Cornell-Dubilier Elec., Inc.*, No. CIV.A. 12-5407 JLL, 2014 WL 4978635, at *11 (D.N.J. Oct. 3, 2014) (upholding use of Habitat Equivalency Analysis where "the Government's estimate for [natural resource damages] sensibly derives from a plausible interpretation of the record.").

restoration projects sufficient to offset the full measure of injury estimated by the Trustees.

Comment: The Settlement allocation of \$1.5 million for injury to surface water resources is too low.⁵⁵ Available science suggests that mining activities, rather than natural features, are the source of the contamination and chronic injury to surface water resources near the mining operations. As such, the Trustees inappropriately minimized impacts to surface water due to mining activities by over-estimating the contributions of naturally occurring contaminants.⁵⁶

After considering all of the contamination affecting the relevant reach of the Red River, regardless of its source, the Trustees estimated that 50 percent of the aquatic resources were impacted by contamination, and attributed all of that 50 percent to the Defendant's activities. The Trustees began by estimating the extent of injury to surface waters based on all contamination, regardless of whether it came from mining operations, natural geology, geography of the mining site, or some other mechanism. Specifically, using the Resource and Habitat Equivalency Analyses discussed above, the Trustees measured lost aquatic (surface water) resources in terms of the amount of aquatic biomass lost per acre of impaired aquatic area. In other words, the Trustees estimated pounds of trout lost per acre of impaired aquatic habitat.

⁵⁵ See, e.g., Mem. Exh. B, comments from: William L. Owen (Sept. 18, 2014) (“... the \$1.5 million ... is grossly inadequate ...” at p. 2; discussion of sources of contamination, including waste rock from mining and erosional scars that are part of the geology of the area, at p. 5; and discussion of modes of transport of contamination that suggest mining operations are the greater culprit, at pp. 5-6; Trout Unlimited (Sept. 25, 2014) (Pre-Assessment Screen shows injuries likely to continue indefinitely)

⁵⁶ See, e.g., Mem. Exh. B, comments from: William L. Owen (Sept. 18, 2014) (discussion of sources of contamination, including waste rock from mining and erosional scars that are part of the geology of the area, at p. 5; and discussion of modes of transport of contamination that suggest mining operations are the greater culprit, at pp. 5-6).

This analysis did not distinguish between losses attributable to the Defendant's operations and those attributable to other causes.

Over the 10.5-mile stretch of the Red River affected by mining operations, available data demonstrated to the Trustees that the densities of resident trout and invertebrate populations ranged from 15 to 80 percent lower than expected in the absence of discharges of contaminants. Given that range in the data (and other variability, such as the fact that contamination from natural sources might be greater during high-flow periods in the river), the Trustees used 50 percent as the approximate fraction of average aquatic services lost each year on account of contamination, both in the past and for long into the future.⁵⁷ Moreover, the Trustees attributed the full 50% of lost natural resource services to the mining activities. As such, this figure is conservative in favor of natural resource restoration, as it is not further reduced to reflect the possibility that some of these losses are due to the geology or other non-mining features. In short, the Trustees' assumption that 50 percent of the impact to aquatic resources is attributable to the Defendant is reasonable because it is premised both on an initial assessment of all impacts to surface water, regardless of the source, and was set above the mid-point within the range of impacts demonstrated by the available data.

Like any methodology, equivalency analysis is subject to criticism, but it also is the subject of published literature, is referenced in the applicable regulations, and is

⁵⁷ Mem. Exh. A Sections 5.a & 5.b ("Assessment Overview"). The Trustees used similar methods to estimate the extent of injury to terrestrial resources (lost "acre-years" for injured land habitat) and for groundwater (contaminated "acre-feet, per year"). Mem. Exh. A, Section 5.c.

regularly used in assessing natural resource damages.⁵⁸ It accounts for the extent of injury, over time, and in units that the Trustees can price and attempt to replace.⁵⁹

The commenters' concerns stem from their reliance on a particular document—the “Pre-Assessment Screen”—to the exclusion of all other investigatory work relevant to the claim. The Pre-Assessment Screen is an early first-look at the site. Pre-Assessments are, by definition, not the final conclusion about resource damages at a site; such screens merely sort out whether the site warrants further assessment. In carrying out that further assessment, the Trustees not only considered the Pre-Assessment screen, but also at least fifty other documents specific to the area, many of them produced *after* the Pre-Assessment Screen. Mem. Exh. A, Section 4 (“Pre-Assessment Screen”).

Although commenters correctly identify the Pre-Assessment Screen as an important document, it is not a dispositive one. Indeed, the Pre-Assessment Screen did not conclude that natural resource injury or damage actually occurred, or the extent of such injury or damage. The Pre-Assessment Screen instead determined that natural resources “*likely* have been affected” by release of hazardous substances and that “released hazardous substances are sufficient *to potentially cause* injury to natural resources” [emphasis added].⁶⁰ These determinations warranted further investigation by the Trustees, which they did, but provide no basis for second-guessing the extent of injury or damage that the Trustees identified. The Pre-Assessment Screen

⁵⁸ See fn. 54, *supra*.

⁵⁹ See *id.*, and Mem. Exh. A, Section 5.

⁶⁰ *Pre-assessment Screen and Determination, Molycorp Site, Taos County New Mexico*, 08/15/2003, Administrative Record File.

did not determine that injury took place or the extent of such injuries. As it should have, it left those issues for further investigation, which the Trustees undertook in the course of arriving at the settlement proposed here.

In the course of weighing all the available data and related information, the Trustees assessed the extent of injury to be about 50 percent of what those aquatic resources would have been in the absence of the hazardous and non-hazardous substances infiltrating the watercourse. Mem. Exh. A, Section 5.b. The Trustees' conclusion does not conflict with the findings the Pre-Assessment Screen, but rather builds on it. The later work of the Trustees accounted for all the other available information, including that from EPA's library of data produced through the clean-up process, after the Pre-Assessment Screen was finalized.

Comment: The Trustees' assessment of injury to aquatic resources does not account for the full extent of injury that could have taken place. The injury extends back for many decades and will extend into the future; thus the funds available for offsetting those injuries could be too low. The mining operations extend back into the early part of the 20th century at least, and open pit mining was part of those operations throughout the middle of the 20th century—a form of mining one would expect to cause significant contamination to aquatic resources.⁶¹

This comment focuses primarily on the question of whether the assessment of natural resource injuries takes into account the full expanse of time during which an injury may have occurred. Even if the commenter is correct that injuries to natural resources extend back to the early part of the 20th century, the Plaintiffs' claim is more limited. As the Decree states, mining at the site began in 1918, open pit mining occurred

⁶¹ See generally, Mem. Exh. B. Many of the commenters raise this concern, e.g., William L. Owen, Trout Unlimited, and Amigos Bravos.

from 1965 to 1982, and between 1966 and 1976, there were as many as 80 spills reported from a pipeline, which runs parallel to the Red River, and crosses it in four locations. CD ¶ B. However, Plaintiffs plead here a claim for natural damages under CERCLA § 107(a)(4)(C), 42 U.S.C. § 9607(a)(4)(C). Complaint ¶ 9. The statutory terms of that claim do not provide for recovery where “damages and the release of a hazardous substance from which such damages resulted *have occurred wholly before December 11, 1980*” (emphasis added). *See* CERCLA § 107(f)(1), 42 U.S.C. § 9607(f)(1). That is, the Trustees may not recover those damages for injuries that occurred before the starting date set by the statute, i.e., before December 11, 1980. Plaintiffs had to consider this statutory limit in assessing extent of injury for which Defendant could be pursued. The Trustees thus limited their assessment of the injury to that which falls within the ambit of their claim.

Second, as noted above, even though the environmental cleanup will address certain of the impacts at issue here and conditions in the Red River will likely improve as the cleanup proceeds, these potential improvements were not taken into consideration by the Trustees. Rather, the Trustees conservatively assumed, for purpose of estimating the extent of injury, that the clean-up work at the mining site would not be completed until the year 2100 – some *eighty-five years* from now. Mem. Exh. A, Section 5.b (“... injury was integrated over time from 1981 to 2100 . . .”). By using this conservative premise, the Trustees increased the estimated injury. That increase produced a larger amount of

natural resource restoration required and a larger settlement payment from the Defendant.⁶²

This approach supports the validity of the settlement today, even though the injury assessments and cost estimates for proxy restoration projects took place a number of years ago. Moreover, because each cost estimate for a proxy restoration project was increased by twenty percent to account for exigencies, the public is further protected against changes in costs over time.

*Comment: The fate of the Anderson Ranch property is unclear. Will it be used to offset injuries to natural resources or be put to some other purpose?*⁶³

One commenter speculated that Anderson Ranch, the ecologically valuable property that is part of the consideration Defendant would provide here, might be used for extraction of hydrocarbons rather than environmental restoration. The commenter also complained of the lack of publically available information about the terms of settlement and the ultimate goals for that property.⁶⁴

⁶² Some commenters suggest that the Trustees are authorizing discharges into the Red River; *see, e.g.*, Mem. Exh. B, comments from William L. Owen (Oct. 15, 2014) (“ . . . Proposed Decree would permit Chevron to release hazardous substances into the River indefinitely.” at p. 6). This statement misses the point. Regulatory processes under other authorities will address whether and how any discharges continue. For example, other processes would include the clean-up efforts noted previously, in addition to permitting conditions that State or federal authorities may impose on any source seeking permission to discharge. The Trustees addressed this uncertainty by using a very conservative assumption about how long it might take for clean-up and other efforts to decrease the migration of contaminants into the Red River. Thus their estimates of extent of injury to that resource was conservative, on the premise that contamination may well not be arrested entirely for a longer time than is currently envisioned by the clean-up. This assumption served to increase the estimates of injury, rather than decrease.

⁶³ *See*, Mem. Exh. B, comment from S. Dudee (Nov. 26, 2014).

⁶⁴ *See id.*

Both the Decree and the statute provide useful information in response. First, as the Decree explains, the Trustees intend to use the property to bolster restoration of natural resources injured by Site releases, not for the production of hydrocarbons. *See* CD ¶ 13 (stating that the purpose of the transfer of ownership of the ranch is to offset lost benefits caused by injury to natural resources).

Second, the statute itself would forbid the use the commenter fears. Specifically, the claim underlying the settlement springs from a statute that requires proceeds realized from a claim be used to address the costs of assessing and redressing the injury that is subject of the claim:

Sums recovered by the United States Government as trustee under this subsection shall be retained by the trustee, without further appropriation, for use only to restore, replace, or acquire the equivalent of such natural resources. Sums recovered by a State as trustee under this subsection shall be available for use only to restore, replace, or acquire the equivalent of such natural resources by the State.

42 U.S.C. Section 9607(f)(1)⁶⁵. Accordingly, the Trustees will treat recovery of Anderson Ranch in the same way as any other “sums recovered” in the settlement.

Third, as with all of the projects proposed to be funded through cash proceeds of the settlement, the Trustees will implement any project under this settlement involving Anderson Ranch only after proposing the project to the public for comment. Mem. Exh. A, Section 9.

Comment: There has been insufficient input from local entities and the public. Individuals, interest groups, and local units of government seek greater

⁶⁵ *Cf., New Mexico v. General Elec.*, 467 F.3d at 1245-46 (obvious objective of Title 42 U.S.C. Section 9607(f)(1) was for proceeds of a successful claim to secure restoration, replacement, or acquisition of the equivalent of a contaminated natural resource, *not* other goods and services of interest to a plaintiff).

*involvement in this matter, including development of the Plaintiffs' claim and certainly in decision-making about restoration.*⁶⁶

Several commenters assert that they should have been afforded a greater role in the Trustees' decision-making. Some commenters suggest they have not had any role and will not have a role if the proposed Decree is entered by the Court. This is incorrect.

First, the Trustee agencies sought input in identifying proxy restoration projects that they could evaluate as part of assessing the amount of money that would be needed to redress injury here. The Trustee agencies solicited such input from each of the following, among others:

- Amigos Bravos (also a commenter here),
- Village of Questa,
- Red River Watershed Group,
- Questa Ranger District of U.S. Forest Service,
- the Association of Conservation Districts of New Mexico, and
- several State of New Mexico agencies likely to have knowledge of the area (*i.e.*, Department of Game and Fish; Abandoned Mine Land Program of the Energy, Minerals, and Natural Resources Department; and the Bureaus of Surface Water Quality, Groundwater Quality, Drinking Water, and Petroleum

⁶⁶ See, e.g., Mem. Exh. B, comments from: Amigos Bravos (Nov. 25, 2014) ("Amigos Bravos is an Interested Party with Expertise; [Its] Offers of Assistance Have Been Ignored" at p. 2); William L. Owen (Oct. 15, 2014) ("Lack of Public Participation" at p. 5).

Storage Tanks of the New Mexico Environment Department). Mem. Exh. A, Section 9.

Second, the proposed Decree explicitly reaffirms the Trustees' intent to seek comment from the public on proposed restoration projects that would be funded by the proceeds of this settlement:

The Trustees intend to solicit public review and comment on the restoration plan and in no event will any project proceed without the public first receiving the opportunity to review

CD ¶ 16.

Third, the Trustee agencies have carefully considered all comments submitted on the proposed Decree. The Trustees have not only submitted these comments, in their entirety, to this Court, but have also endeavored to answer the commenters' concerns in this Memorandum and its exhibits.

Comment: The Trustees did not use regulatory assessment procedures available for assessing damages. Title 43 C.F.R. Part 11 sets out a procedure that the Trustee Agencies should have used to complete the damage assessment. ⁶⁷

Some commenters maintain that Plaintiffs' Trustees did not assess the injury properly because they did not use all of the specific tools set out in Title 43 C.F.R. Part 11. This comment is incorrect for at least three reasons: first, the tools are an option available to the Trustees, but not a requirement; second, where it made sense, the Trustees did use the approaches set out in Part 11, and will continue to do so in selecting restoration projects in the future; and third, given

⁶⁷ See, e.g., Mem. Exh. B, comment of William L. Owen (Oct. 15, 2014) (" . . . nor have [the trustees] . . . 'determined' a Natural Resources Restoration Plan as set out in 43 Code of Federal Regulations section 11.10 *et. seq.*, Natural Resource Damage Assessments." at pp. 1-2)

the significant amount of data available at this Site, portions of Part 11 are not as useful here as they might be at other sites.

Importantly, those regulatory procedures are not a requirement but instead are a tool that Trustees may elect to employ, or not. Where they do employ those procedures, the Trustees gain a rebuttable presumption in favor of their findings in the trial of their claim.⁶⁸ Use of these provisions goes to whether the Trustees can secure an evidentiary advantage in litigation. The question before this court, however, is whether the Trustees have valued the claim by reasonable methods and whether this court should approve the settlement, applying the standards for assessing proposed consent decrees. As described above and in Mem. Exh. A, Sections 2, 4, and 5.a., the Trustees investigated and evaluated their claim in some detail, often making use of the approaches found in Part 11 that the Trustees found useful in this matter.

As further explained in Mem. Exh. A, the significant amount of data available for this assessment reduced the need to use all of the Part 11 procedures. However, where appropriate, Part 11 procedures were employed. Specifically, the Trustees employed one of the key analytic tools identified in Part 11 – namely, the Resource or Habitat Equivalency Analysis. In general, irrespective of the extent to which the Part 11 process was employed, the Trustees carried out a lengthy analysis of injury and of the costs of offsetting that injury using assumptions very favorable to the Trustees. *See, e.g.*, Mem. Exh. A, Sections 5 (Assessment Overview”) and 8 (“Restoration: Overview of Analysis Performed to Test Adequacy of Recovery”).

⁶⁸ *See* fn.11, *supra*.

*Comment: The Trustees paid insufficient attention to administrative costs. By their nature, the costs of planning and permitting projects can be expensive. Especially in the case of injury to surface water, such costs might consume so much of the settlement proceeds as to make impossible the implementation of the selected natural resource restoration projects.*⁶⁹

Some commenters fear that administrative costs incidental to any project will consume the available settlement funds and foil the completion of restoration projects. The Trustees accounted for this concern in the settlement and have continued to manage it outside of the settlement.

As part of estimating costs to test whether the contemplated settlement would produce proceeds sufficient for restoration, the Trustees included estimates for tasks such as development of a restoration plan and environmental assessment, oversight of project implementation, and other related administrative tasks. Those estimates account for just under six percent of the total settlement proceeds here. Mem. Ex. A, Section 8.d (“Estimation of Future Restoration Planning Costs”). Moreover, since reaching the settlement, the Trustees have determined that they will likely be able to reduce their administrative costs by using in-house resources available from U.S. DOI. As such, it is highly unlikely that administrative costs will consume the settlement funds and prevent them from being used as intended.

VI. CONCLUSION

After extended bargaining over the value of the Trustees’ claim and careful evaluation by the Trustees of whether the proposed settlement amounts would be large enough to offset the

⁶⁹ See, Mem. Exh. B, comment of William L. Owen (Sept. 18, 2014) (administrative costs and expenses could be significant, at pp. 6-7).

Trustees' assessment of injury, the parties have put before the Court a proposed Decree that warrants entry. Nothing in the comments dictates a different result.

The State of New Mexico and the United States respectfully request that the Court enter the Consent Decree as a final judgment by signing it on page 36.

Respectfully submitted,

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Exhibits:

- A: *Technical Response to Public Comments* (with attachments)
- B: *Comments Received by U.S. DOJ on Consent Decree proposed for U.S. and New Mexico v. Chevron Mining, Inc., No. 1:14-cv-783, D.N.M.).*
- C: Letter from David W. Partridge, Chevron Mining, Inc. (October 3, 2014)
- D: U.S. EPA, Chevron Questa Mine site summary (Updated July 2015)

EXHIBIT A
to
Plaintiffs' Memorandum in Support of
Motion to Enter Consent Decree

U.S. and New Mexico v. Chevron Mining, Inc.,
No. 1:14-cv-783, D.N.M.

Technical Response to Public Comments

United States and State of New Mexico v. Chevron Mining Inc.,
Civil Action No. 14cv783 KBM-SCY,
United States District Court, District of New Mexico

Technical Response to Public Comments

1. Introduction

The State of New Mexico and the United States are trustees for natural resources in the vicinity of Chevron Questa Mine site (Site), near the village of Questa, Taos County, New Mexico.

The state and federal agencies that are trustees for natural resources near the Site are: the New Mexico Office of the Natural Resources Trustee, the United States Department of the Interior, through the U.S. Fish and Wildlife Service and the Bureau of Land Management, and the United States Department of Agriculture, through the Forest Service. These agencies are collectively referred to as “the Trustees.”

The proposed Consent Decree is a natural resource damages (NRD) settlement, in which the Trustees seek compensation for injury to natural resources near the Site. The Trustees negotiated with Chevron Mining, Inc. (CMI) and the parties reached agreement in a Consent Decree. (Additional background information regarding the Site is provided in the Complaint, the proposed Consent Decree and the Administrative Record).

The proposed Consent Decree was made available for public comment on August 28, 2014. The Trustees received 12 requests for extension or delay to the public comment period. The Trustees extended the public comment period through November 26, 2014. The Trustees received letters or emails from eleven different individuals or organizations. This document responds to these public comments. Various people worked on behalf of the Trustees in undertaking the natural resource assessment and restoration activities described in this document: federal and state employees whose official duties include this kind of work and who have developed expertise in it, along with contract help retained by trustee agencies to serve technical needs.

The undersigned technical representatives—Karen Cathey and Russ MacRae—are government employees; as summarized below, their official duties include natural resource damages work. The representatives contributed directly (and personally) to many of the activities described below. To respond to these public comments, the undersigned technical representatives considered: (1) their personal knowledge of this work; (2) the experience and expertise they have gained in performing similar work at other sites; (3) their consultation with other federal and state officials who had personal knowledge of portions of this work; and (4) materials from the Administrative Record File for this matter, which was made available to the public during the comment period. Based on this information, the undersigned declare under penalty of perjury that this narrative is true and correct.

Ms. Karen Cathey is Natural Resource Damage Assessment and Restoration Coordinator for the Southwest Region of the U.S. Fish and Wildlife Service. In addition to her direct work on this matter, Ms. Cathey supports the work of field offices and refuges during natural resource damage assessment activities, including identification of potentially injured resources, pathway and injury determination, identification and scaling of restoration alternatives, and documentation of planning work called for under the National Environmental Policy Act. Ms. Cathey also is responsible for assuring that case activities incorporate the requirements of Department of Interior and U.S. Fish and Wildlife Service policy. She has worked on various natural resource damages matters over the years, including large complex matters known as the Tri-State Mining District, which is a composite case involving four Superfund sites at which there were releases related to mining lead, zinc, and cadmium; and the Phelps Dodge Industrial Complex, involving an NRD claim related to releases from copper mining activities. Ms. Cathey has been with the Service for more than 25 years and holds both a Bachelor's degree and a Master of Science degree in Forestry (Stephen F. Austin State University).

Mr. Russ MacRae, at the time of the work discussed here, served as a Senior Environmental Contaminants Biologist for the U.S. Fish and Wildlife Service. In all, he has served more than 18 years with the Service as: a biologist, a manager charged with addressing environmental contaminant issues, and currently as Field Supervisor of the Eastern Washington Field Office overseeing a staff of 10 conducting a variety of Natural Resource Damage Assessment and Restoration and other environmental work. He has been part of many types of environmental projects, *e.g.*, remedial investigations, feasibility studies, and natural resource damage assessments – including projects involving general aquatics toxicology. Mr. MacRae is also a long-time instructor for the DOI's NRDAR training at the USFWS' National Conservation Training Center, and is often an invited instructor/speaker for various State, Federal and Tribal NRDAR meetings and workshops. He holds a Bachelor of Science degree in Biology (University of Maine) and a Master of Sciences degree focused on Environmental Toxicology, Geochemistry, and Aquatic Ecology (University of Wyoming).

Finally, both this Technical Response and the Plaintiffs' memorandum to which it is an exhibit, quote or otherwise cite directly to a number of documents from the Administrative Record File. Those documents are attached to this Technical Response for reference and are true and accurate copies from that File.

2. Federal and State Involvement in Remedial Activities

Representatives of both state and federal governments have had involvement in the cleanup efforts at the Site, including regular participation and input to the United States Environmental Protection Agency's (EPA) Technical Advisory Group. Over the past fifteen years, both state and federal agencies have also assisted in: implementation of the State of New Mexico's Mining Act at the Site; development of water quality standards applicable to the Site; the determination of a Total Maximum Daily Load (TMDL) report for the Red River; and in EPA's issuance of

National Pollution Discharge and Elimination System (NPDES) permits for the facility. Participation in these processes allowed the Trustees to have access to a large amount of data about the Site and the Red River. The public also participated in many of these processes. Most pertinent here, as part of analyzing natural resource damages related to the Site, the technical staff for the federal Trustees considered the work of EPA and the state cleanup agencies, including data they gathered.

3. Remediation versus Damage Assessment

Several commenters were concerned that the proposed settlement in the Consent Decree is inadequate to remediate future releases at the Site. The EPA has selected a remedy for the Site, through the Superfund remediation process in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA issued a Record of Decision (ROD) on December 28, 2010. The ROD selects a remedy with five components. EPA estimated that the cost of implementing the remedy will be more than \$500 million.¹ CMI is currently implementing some portions of the remedy.

The Decree does not limit the remedial actions that may be directed by EPA, or through other regulatory mechanisms, now or into the future. The Department of the Interior Natural Resource Damage Assessment and Restoration (NRDAR) Regulations (40 C.F.R. § 11) provide that NRD work is intended to offset “residual injuries,” not to remediate the Site.

4. Pre-Assessment Screen

The Trustees prepared a Pre-Assessment Screen (PAS), consistent with the NRDAR regulations at 43 C.F.R. §§ 11.20 to 11.25. The purpose of the PAS was to determine relatively quickly whether public funds should be committed to evaluating, in greater detail, the extent of natural resource injuries associated with the Site. The PAS was based on a “rapid review of readily available information that allow[ed] the authorized official to make an early decision” on whether to proceed any further. 43 C.F.R. §11.13(b). In the PAS, the Trustees concluded there are “[n]atural resources and their supporting ecosystems and services that have been, or potentially have been, affected by the discharge or release of the hazardous substances, [which] include but are not limited to groundwater, surface water, sediments, soils and biological resources on and surrounding the Molycorp mine, mill, tailings facility, and Red River corridor.” Through the PAS, the Trustees determined it was appropriate to proceed with development of the NRD claim.

Several commenters appear to have concluded that the PAS was an indicator of the final settlement amount. The PAS referenced 29 Site-specific documents prepared between 1971 and

¹ See *Record of Decision for Molycorp Incorporated Site December 20, 2010*, <http://www.epa.gov/region6/6sf/newmexico/molycorp/06-9158694.pdf> (last visited Aug. 6, 2015).

2001. The overall administrative file for the settlement contains more than fifty (50) additional Site-specific documents. Many of these documents were produced after the release of the PAS. The PAS was an important first step, but it was not the definitive document in the Trustees' decision to settle the claim.

Commenters also relied on a study by Abshire (1998) to distinguish between mine-related causes and other causes of fish and aquatic injury in the Red River. The Trustees considered the Abshire study in their analysis; it, along with others, helped the Trustees reach the conclusion that an assessment was warranted and supported their decision to proceed further. This study was among the earliest to compile the chemistry and biology data available at the time, and argued convincingly that both mining and background sources were contaminating the river and adversely affecting biota. However, the Abshire study was also not definitive – while it analyzed existing data, it did not establish injury to natural resources and it alone was not sufficient to quantify injury for purposes of the Trustees' settlement discussions with CMI. Ultimately, the Abshire study, as well as more than 50 other technical documents, supported the Trustee's determination of appropriate settlement.

5. Assessment Overview

The subsections below discuss the Trustees' approach to assessment and the quantification of injuries to aquatic and terrestrial resources. In light of the focus of the public comments (in which much more attention was focused on surface water resources than on either ground water resources or terrestrial resources), this Response explains the Trustees' general approach and provides added detail about the assessment and quantification of surface water resources. Notably, of the \$4 million in damages that would be secured under the settlement, about \$2.5 million will be aimed at ground water restoration, with the balance for surface water and terrestrial impacts, with the lion's share of that sum aimed at the surface water resource. Preservation of the Anderson Ranch property will address a variety of restoration concerns, including replacement of terrestrial resources.

a. Approach to Assessment – Use of Equivalency Analysis

The Department of the Interior NRDAR regulations specifically identify evaluation tools helpful in estimating appropriate compensation for NRD claims. In this case, the Trustees used established approaches called Resource or Habitat Equivalency Analysis (REA/HEA) to quantify injuries, as allowed by regulation. 43 C.F.R. § 11.83. This equivalency analysis method was developed to quantify how much restoration is required to compensate the public for losses from discharges of hazardous substances and oil into the environment. A key element in conducting a REA/HEA is defining the level of services being provided by a habitat or resource, relative to baseline conditions. The REA/HEA also accounts for the duration of the injury. For example, one acre of land being 100% injured for one year would be stated as an injury of one "acre-year."

The Trustees were limited by the statute in asserting the duration of the injury to the Red River. Critically, commenters did not take this statutory limit into account. CERCLA bars recovery where “damages and the release of a hazardous substance from which such damages resulted have occurred wholly before December 11, 1980.” 42 U.S.C. §9607(f)(1). The Trustees recognized that the duration of injury here extends back in time much earlier than 1980, however, in compliance with CERCLA, the Trustees did not assert a claim for any injuries occurring before 1980. However, the Trustees did not exclude any injuries occurring after December 11, 1980, even if the original release leading to the injury occurred prior to this date.

Calculation for duration of impacts into the future was also necessary, especially considering that the ultimate Site remedy was uncertain at the time of the assessment. To address this uncertainty, the Trustees negotiated from the conservative assumption that any clean-up of the Site would not be effective for many decades. Specifically, for the purposes of damage calculations, the Trustees assumed that injury would continue until 2100. The Trustees’ conservative bargaining premise tended to expand the size of damages calculated and assured that the Trustees did not underestimate the extent of injuries to natural resources. It should be noted that the Trustees are in no way “authorizing” continued discharges to the Red River.

The REA/HEA methodology incorporates a discount rate into the calculations, so that impacts and benefits that occur in different years are weighted differently. This factor takes into consideration that an acre of wildlife habitat, for example, from 10 years past has offered benefits to wildlife over that 10 year period (“10 acre-years”), and thus has more value than just the acre as it currently exists. Conversely, the removal of those services, through injury, for the past 10 years would compute to greater amount of injury than if it was calculated at only the current window of time. An annual discount rate of 3% is typically used in REA/HEA calculations.

b. Quantification of Injuries to Aquatic Resources

To scale injuries to aquatic resources, the Trustees used a combination of the REA and HEA. In this case, quantifying aquatic injuries in terms of changes in fish biomass over time was a common metric that could be used to weigh benefits of restoration projects directed to increase fish biomass. An injury of one “lb-acre-year” would account for fish biomass in the river being reduced by one pound for one year in a specific river area (acres). This analysis gave the Trustees a common metric with which to establish a baseline and to compare the benefits of restoration projects in small tributaries, through increased fish biomass, to the injuries occurring in the much larger Red River, which would have greater potential biomass of resident fish.

The Trustees evaluated streams and rivers of different sizes that support different densities and biomass of fish to support their estimated baseline and injury analysis. Available data indicated that the baseline estimate of biomass per acre for resident trout in the Red River was approximately 35.4 lbs/acre. Based on a review of data collection points, the injured area was

found to extend for 10.5 miles of the Red River, from just upstream of Columbine Creek to just upstream of the State fish hatchery at Questa. This area covers 23.5 acres of the Red River, based on average width.

The Trustees assessed the injury to aquatic resources by estimating the decrease in resident trout and invertebrate populations compared to expected conditions in the Red River in the absence of releases from the mine. Examination of individual data points indicated that the densities of invertebrates and resident trout in the 10.5 mile stretch of the River were between 15% and 80% lower than the expected densities for these organisms in the absence of releases from the mine. This wide range was due to differing analytical approaches used in the studies that were reviewed and differing contributions of contamination from baseline sources. The Trustees therefore used an approximate midpoint of 50% as an overall estimate of the “service loss” to aquatic resources in this part of the Red River. Put differently, by estimating a “service loss of 50 percent,” the Trustees estimated that the injured areas of the Red River provide about half of the ecological functions that would be provided by those areas in the absence of releases of hazardous substances from the Site during the allowable (i.e., post-1981) period. This analysis informed the Trustees that, integrated over time, restoration projects should provide an increase in services that would be sufficient to offset this 50% service loss.

Both CMI and the commenters have questioned the extent to which this impairment (or service loss) is fairly attributable to naturally-occurring contamination of the aquatic resource, *i.e.*, loss that would have occurred, even without any mining, due to the geology and other physical features of the area. CMI has argued that the extent of naturally-occurring impairment is very high and, therefore, should affect the Trustees’ baseline for assessing the extent of injury. Certain of the commenters contend that the impact of non-mining activities is very low, and that the Trustees inappropriately minimized their impact assessment by over-estimating the contributions of naturally occurring contaminants. In fact, neither is correct. Although the Trustees’ analysis of the relevant data and the physical features of the site suggested that some impairment probably was fairly traceable to non-mining, natural conditions, the Trustees diligently worked to conservatively estimate mine-related versus natural, baseline influences on injury. “Conservative” as used here means that the Trustees considered the data with an eye toward being sure that injury fairly attributable to mining operations was classified that way, which tended to reduce the amount of injury attributable to natural, baseline conditions such as contamination from scarring.

The extent of injury to aquatic resources in the Red River was then quantified on an annual basis by multiplying the estimated percent service loss (50%) by the baseline estimate of biomass per acre for resident trout in the Red River (35.4 lbs/acre) to quantify the injury in units of lbs/acre. This injury was integrated over time from 1981 to 2100, resulting in a quantified injury of 1,270 discounted lb-years per acre (rounded), based on the 3% discount rate defined by the Office of Management and Budget. This value was then multiplied by the area of injury to yield a total quantified injury for the entire area of injury (23.5 acres) resulting in a total estimated quantified

injury of approximately 29,900 lb-years for the entire area of injury. The Trustees' consideration of settlement terms was fully informed by this conservative analysis. Ultimately, however, CMI did not accept the Trustees' estimate of aquatic injuries, and continued to assert that geologic and hydro-geologic conditions comprising the naturally-occurring environment were the principal causes of injury here.

c. Quantification of Injuries to Terrestrial Resources

The injury evaluation for terrestrial resources focused on areas in proximity to the Site and the tailings facility where contaminated soils could harm area wildlife. The area of contaminated soil, in acres, was used as the basis for quantifying the terrestrial injury. For terrestrial resources, injuries and restoration benefits were quantified through a HEA, in units of "discounted service acre-years," (referred to as "acre-years"). Similar to the analysis of aquatic injuries, the Trustees quantified injuries starting in 1981, with injuries expected to continue through at least 2100.

To gain inputs to the HEA, the Trustees compared soil concentrations for ten different metals at the Site to "toxicity thresholds" – *i.e.*, concentrations that have been shown to cause toxicity to birds or animals in field or laboratory studies. These metals were boron, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, vanadium, and zinc. While not all the metals targeted are listed hazardous substances under CERCLA (*i.e.*, "listed"), considering them as indicators for likely injury was determined to be the best and most conservative approach to assessing risk. In general, the analysis indicated that molybdenum (not listed) exceeded toxicity thresholds more frequently and to a greater extent compared to the other metals. For certain areas of the mine, lead (listed) showed the greatest contribution to toxicity. Given this analysis, the Trustees focused further analysis of injuries based on molybdenum and lead.

To quantify injury across the Site, the Trustees used a spatial averaging function to convert estimates of service loss at individual soil sampling locations into an average across an area. Overall, the trustees concluded that the Site accounts for a loss of between 23 and 44 "service acres" of wildlife habitat.

d. Quantification of Injuries to Groundwater Resources

Groundwater injuries and corresponding restoration projects were quantified in units based on the volume of acre-feet affected per year. Further discussion of the Trustees' analysis of groundwater injuries is not included here, because the only comment addressing groundwater provisions of the proposed settlement fully support that portion of the agreement.

6. Public Comments on Injury Quantification

Some commenters suggested that the Trustees did not perform an assessment of injuries in accordance with the NRDAR regulations at 43 C.F.R. Part 11. This is not true. The Trustees relied on the extensive information available through EPA and the State and damage

determination methods specified in 43 C.F.R. § 11.83. The Trustees were mindful that the regulations promote the use of cost effective procedures, 43 C.F.R. § 11.11, and the Trustees reasonably relied on the vast and continually growing body of scientific information available on the Site. The extensive body of information collected through the Remedial Investigation was available to the Trustees and the public. Likewise, because existing data was sufficient and no further data collection was necessary, an Assessment Plan to guide data collection (discussed in the regulations) was not necessary.

Several commenters expressed concern regarding the perceived lack of public input on the assessment process. NRD claims are sometimes resolved via litigation, so confidentiality issues may arise that preclude sharing of litigation-sensitive information. Nonetheless, the Trustees shared information with the public to the extent possible.

Also, several Trustee representatives were engaged in the regulatory and cleanup discussions concerning remediation and data being collected at the Site. The EPA and the Trustees established a Memorandum of Agreement that memorialized their cooperation. Mr. Russell MacRae with the U.S. Fish and Wildlife Service (Service) in Albuquerque, New Mexico was the Trustee staff person who was perhaps most engaged with other agencies regarding the Site. Mr. MacRae's responsibilities included both EPA Remedial and NRD processes. Mr. MacRae routinely attended EPA Technical Assistance Group (TAG) meetings, as did Barry Forsythe, the Service liaison to EPA for site cleanup issues based in EPA Region 6, Dallas, Texas. Overall, Mr. MacRae was very active in the cleanup during the time of the assessment. He participated in public meetings and Site visits, and provided numerous technical comments on various State, EPA, and Molycorp regulatory documents over the years.

The Trustees' technical contractor's representatives also attended numerous cleanup meetings to maximize consistency in understanding and interpreting Site data and studies. Through this participation, the Trustees' analysis was informed by literature and data collection activities and the Trustees were aware of the concerns and data interpretations of numerous parties, including CMI and local environmental groups.

7. Evaluation of other Resources of Concern to Commenters

Some commenters have stated a perceived lack of consideration of effects on other local resources, such as agricultural practices and recreation. In fact, the Trustees did consider these potential service losses, while recognizing that adverse effects to people must be tied closely to an injury to the natural resource that provides the benefits (services) to people. The following provides a brief explanation of the Trustees' evaluation of other resources of concern to certain of the commenters.

Air Injuries: Prior to 1993, dried tailings were blown by strong winds and carried beyond the tailings repositories into the town of Questa, including to the then Questa Junior/Senior High School. By 1993, tailings were covered and re-vegetated as soon as possible after deposition to

minimize blowing tailings. While the dust was clearly an irritant to local community members, data did not support a compensable service loss. However, this relocation of contaminated material was considered by the Trustees, who evaluated soils and biota data collected in areas subject to windblown tailings, and accounted for injuries to natural resources in these areas in quantifying the terrestrial damages.

Recreational Service Losses: Recreational service losses, such as the angling activities discussed in comments, were not directly assessed, but are a recognized component of liability for natural resource injuries. Rather than directly quantify these losses, the Trustees determined that, because the aquatic injury claim was based heavily on losses to the fishery, restoration projects aimed at increasing fish biomass would simultaneously provide enhanced recreational benefits without amounting to a “double recovery” which is prohibited under CERCLA. For example, the Trustees assumed that a project such as the removal of a dam would improve the habitat and fishery health, while at the same time providing expanded opportunities for brown trout fishing. Each of the proxy projects that the Trustees considered focused on restoration in the vicinity of the Red River, and the Village of Questa.

Croplands and Acequias (*i.e.*, man-made canals): While there is evidence that both croplands and acequias were contaminated by historical tailings spills, and continue to be contaminated by the diversion of contaminated river water, the Trustees concluded, based on available data, that neither the historical tailings spills nor current acequia water quality injured any natural resources under Trustee jurisdiction, or in any way impaired agricultural practices (an associated service) during the allowed time, from 1981 onward.

Livestock: Livestock are not a “natural resource” and therefore are not part of the Trustees’ claim.

8. The Trustees’ Analysis of Natural Resource Restoration Projects

To determine an appropriate settlement amount, the Trustees considered the cost of various combinations of hypothetical restoration projects that would compensate for the identified injury. By using cost estimates of proxy projects, the Trustees ensured that the settlement amount would provide sufficient funds to pay for restorations projects that would offset the service losses incurred. The Trustees’ estimate of the service losses is conservative, in favor of restoration, because it is based on a “worst case” scenario, in which decades would elapse without effective, implemented clean-up of the Site.

The purpose of this exercise was not to select the projects to be implemented. Rather, the identification and costing of projects was intended to test how much money or other resources the Trustees should secure in order to be confident that their view of the identified, quantifiable injury could be restored. If the Consent Decree is entered, the Trustees will prepare a proposed Restoration Plan/Environmental Assessment (RP/EA) that will propose specific projects and will be made available for public review and comment.

a. Evaluation of Proxy Restoration Projects

After quantifying the extent of the natural resource injury, the Trustees developed a list of more than 40 proxy restoration projects with input from the public, including several of the entities that provided comments on the proposed Decree. The Trustees screened the list using factors such as whether the proxy projects: addressed resources injured or services lost from mine releases; were technically and administratively feasible; conflicted with ongoing or planned response or remediation work; and, provided a net environmental benefit. In addition, Trustee representatives reviewed other factors related to a given project, such as the need for water rights or required cooperation of private landowners. Several of the proxy projects were eliminated from consideration as inappropriate to meet the needs of this settlement.

After an initial screening, six projects moved forward for further evaluation. To determine the sufficiency of this group of proxy projects, the Trustees measured the benefits expected from each project using a framework directed to each resource category—aquatic, terrestrial, or groundwater. Through use of the REA/HEA, the Trustees measured all resources that would be expected to benefit from the proxy project and compared it to the needs identified in the injury quantification. For example, the potential fish biomass benefits from implementation of the Cabresto Creek proxy project were quantified. Ultimately, the Trustees determined that this group of six proxy projects provided natural resource benefits sufficient to compensate for losses resulting from the resource injuries.

b. Sample of Projects Identified: Aquatic

The Trustees carried out this kind of analysis of proxy projects for each resource category (*i.e.*, aquatic, terrestrial and groundwater). Given the importance of trout in this area for providing aquatic resource services, the Trustees decided to use the biomass of trout per acre as an index (or “metric”) for measuring aquatic debits and credits. In other words, a restoration project that increases trout biomass by 50% in a small stream with an initial biomass of 8 pounds per acre (lb/acre) would generate half the credit of a restoration project that increases trout biomass by 50% in a larger stream with an initial biomass of 16 lbs/acre.

Restoration projects should be located in areas where the restoration activities would result in the maximum, sustained benefits to the resources injured. The Trustees looked most intensely at projects that could be effectively implemented on the tributaries to the Red River instead of in the Red River itself. (The Trustees disfavored restoration projects in the main stem of the Red River because of the potential impacts of ongoing cleanup activities, roads, bank stabilization issues due to flooding (which decrease fish habitat quality), irrigation, and waste water treatment plant discharges from the town of Red River.)

Because commenters’ most specific concerns focused on aquatic injury, here is a sample of the aquatic restoration proxy projects the Trustees identified to test a settlement amount in the governments’ interests:

Construction of a fish passage structure on the Red River at the state fish hatchery: This project involves constructing a fish passage structure on the existing water diversion structure at the Red River fish hatchery to enhance the resident trout population located in the Red River by: restoring connections between the trout populations above and below the hatchery, allowing brown trout access to high quality habitat upstream of the hatchery, promoting trout spawning, and increasing the density of resident brown trout upstream of the hatchery diversion. Trout is a type of fish appreciated by sport fisherman, thus this project was attractive as restoration for recreational impacts.

Enhancement of Rio Grande cutthroat trout (RGCT) habitat on Columbine Creek: The RGCT is a subspecies of cutthroat trout that is suffering from declining populations due to intrusion of non-native trout, degradation of habitat, and disease. A population of the RGCT in the upper reaches of Columbine Creek is known as one of the few core populations of RGCT, which has been protected by a natural barrier that has isolated them over the past century. This project involves enhancing habitat on Columbine Creek to expand this RGCT population by constructing a barrier to fish passage below this natural barrier on the lowest reach of the creek. Non-native trout would then be removed between the constructed barrier and the natural barrier. This newly protected habitat would provide a secure buffer for the existing population in the upper reach.

c. Estimations of Proxy Project Costs

After the benefits of the proxy projects were quantified and the Trustees concluded that the projects would meet required restoration values, the Trustees calculated the costs for implementing each project to determine the amount of an appropriate settlement. This approach also could be thought of as restoration-based cash-out, a method by which Trustees estimate the appropriate settlement amount by evaluating projects that benefit the same natural resources injured by the Defendant's operations.

The Trustees considered various factors in estimating the costs of the proxy projects, including engineering costs (design, investigation needs, construction, monitoring and maintenance), biological costs (labor and expenses for activities such as non-native fish removal), and permitting costs. In addition, the Trustees included a 20% contingency to account for unforeseen activities and costs. This total cost estimate for construction and monitoring of the proxy projects was about \$1,291,000 and is summarized in "Molycorp Project Implementation Cost Estimates," dated May 22, 2007 (attached here and also part of the Administrative Record File that was provided to the public).

Some commenters note that the cost estimates used by the Trustees may be outdated because they were completed a number of years ago. Although more current cost estimates would be marginally better, for these purposes, these estimates are sufficient. At this stage, the Trustees are simply estimating the cost of projects that could serve to offset the injuries. These are not the

hard-and-fast cost estimates for the actual projects that the Trustees will eventually select, after public notice and comment.

d. Estimation of Future Restoration Planning Costs

In a settlement where the Trustees receive cash and property to implement projects needed to achieve restoration, the Trustees also must ensure they will be able to carry out the planning and management efforts necessary. These additional costs for each Trustee agency were estimated based on the level of participation expected for restoration planning efforts. Such efforts include meetings with the public, specifically to gain suggestions on restoration projects and to discuss project proposals, evaluation of project impacts, development of an RP/EA, review of the final restoration plan, trustee council meetings during the planning process, oversight of project implementation, administrative record keeping, and monitoring to ensure success. The Trustees estimated these at about \$219,000, which is less than six percent of the total settlement. Note that these costs will be adjusted by the Trustees, based on restoration planning activities as they actually occur.

If the settlement is finalized, the Trustees are discussing using the DOI Restoration Unit, located in Denver, Colorado, for assistance in evaluation of restoration alternatives, including those suggested by further public input. The DOI Restoration Unit was specifically created, and funded out of appropriated funds, to provide engineering and ecological/biological support to the DOI's case managers/teams, as well as assistance with meeting various legal and regulatory compliance requirements, and identifying possible partnering opportunities. By using the DOI Restoration Unit to support restoration planning, the Trustees expect to save expenditure of restoration funds.

9. Other Public Comments

Many commenters objected to a perceived lack of public input on which restoration projects were used in estimating costs. In fact, the opposite is true. Representatives of the Trustees actively sought input in selecting and evaluating restoration projects that might be used to develop the final settlement amounts. Suggestions for project ideas came from the Trustees, CMI, other government agencies, and non-profit organizations. In soliciting input on proxy projects, the Trustees contacted these governmental and non-governmental organizations:

- Amigos Bravos
- N.M. Association of Conservation Districts
- N.M. Department of Game & Fish
- N.M. Environment Department – Surface Water Quality Bureau, Groundwater Quality Bureau, Construction Programs Bureau, Drinking Water Bureau, and Petroleum Storage Tank Bureau

- N.M. Energy, Minerals, and Natural Resources Department – Abandoned Mine Land Program
- Red River Watershed Group
- U.S. Bureau of Land Management
- U.S. Forest Service, Questa Ranger District
- Village of Questa

Although the Trustees did not document their analysis of valuation through a Restoration Compensation Determination Plan (RCDP), they did review more than 40 candidate restoration projects, many of which were proposed by the entities listed above. The candidate proxy projects helped the Trustees determine the types of projects that may be appropriate to address the resource injuries at issue here. The specific creation of an RCDP would have been redundant and inefficient, which would not have met the intent of regulations, where they call for efficiency (40 C.F.R. § 11.11). Given the extent of public participation in identifying candidate proxy projects, the Trustees opted to delay public review until selection of actual restoration alternatives.

Anderson Ranch as Element of Restoration: Several commenters expressly supported the protection of Anderson Ranch as part of the settlement. One commenter raised concerns about making CMI's Anderson Ranch property part of the settlement. Principally the commenter questioned what would happen to the property, especially given that the property may overlie deposits of hydrocarbons that might lead to development injurious to restoration of natural resources.

In the past, some of Anderson Ranch has been subjected to unauthorized grazing by cattle, which degrades the ecologically sensitive habitat in this area. Under the proposed settlement, CMI must transfer this property to the United States and fence it so as to preclude improper grazing while also permitting "the unrestricted movement of wildlife." (Appendix D of Consent Decree). The property includes more than 100 acres of upland habitat and another 100 acres of marsh (a habitat under great stress in New Mexico), along with more than one acre of open water. This unusual, groundwater-fed wetland is heavily used by wildlife, notably a large and diverse number of water fowl. The mix of habitats, notably marsh and open water, is also attractive to wildlife in various stages of life. For example, birds might nest in upland, feed in marsh areas, and raise their young in open water. As such, Anderson Ranch is valuable property for purposes of natural resource restoration.

Regarding the potential for commercial extraction of hydrocarbons, the Trustees have no such plans and intend to use this property to foster restoration of lost natural resources. Maintaining the Anderson Ranch free from commercial or other development that could compete with native animal and plant species will protect and foster the types of resources injured by CMI's mining operations. Like any restoration project that will be proposed here using the cash proceeds of

this settlement, restoration projects making use of this property must also be analyzed separately and proposed to the public for comment before any project is finally selected or implemented.

Future Administrative Costs Associated with Restoration: As noted above, the Trustees estimated future costs associated with restoration planning and implementation at about \$219,000—less than 6 percent of the total settlement cash. If the proposed Consent Decree is entered, the Trustees intend to use the DOI Restoration Unit for assistance in evaluating restoration alternatives. In so doing, the Trustees expect to save on expenditure of restoration funds.

Conclusion

The Trustees evaluated and quantified the injuries to natural resources by evaluating voluminous data collected during EPA's Remedial Investigation and other regulatory processes and scaling these injuries in accordance with well-accepted methods set out in the applicable regulations—the REA and HEA. With input from the Trustee agencies, other government agencies, CMI and non-profit organizations, the Trustees identified candidate proxy projects and compared the injury assessment to the benefits such projects would provide. The Trustees then used these proxy projects as a basis for estimating the amount needed to settle their claim, which is an approach that is fully consistent with the Trustees' statutory and regulatory authority. The settlement proceeds should produce restoration, replacement, or acquisition of natural resources that corresponds well to the extent of injury to such resources. As a result, the settlement embodied by the proposed Consent Decree is fair, reasonable, and based on a thorough evaluation of injury to natural resources in the vicinity of the Site.

Attachments:

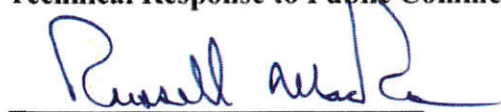
Abshire, D. 1998. Report on hydrological connection associated with Molycorp mining activity, Questa, New Mexico. U.S. EPA Region 6, NPDES Permits Branch.

Molycorp Project Implementation Cost Estimates,” dated May 22, 2007

Signature Page:

United States and State of New Mexico v. Chevron Mining Inc.,
Civil Action No. 14cv783 KBM-SCY,
United States District Court, District of New Mexico

Technical Response to Public Comments

A handwritten signature in blue ink, appearing to read "Russell MacRae", is written over a horizontal line.

Russell MacRae

Field Supervisor

U.S. Fish and Wildlife Service

Eastern Washington Field Office


Date:

8/27/15

Signature Page:

United States and State of New Mexico v. Chevron Mining Inc.,
Civil Action No. 14cv783 KBM-SCY,
United States District Court, District of New Mexico

Technical Response to Public Comments


Karen Cathey

Natural Resource Damage Assessment
and Restoration Coordinator

U.S. Fish and Wildlife Service

Southwest Region

Date: 8/28/2015

United States and State of New Mexico v. Chevron Mining Inc.,
Civil Action No. 14cv783 KBM-SCY,
United States District Court, District of New Mexico
Confirmation for Technical Response to Public Comments

Confirmation of Role of Mr. MacRae and Ms. Cathey by Southwest Regional Director, U.S. Fish and Wildlife Service

I, Benjamin N. Tuggle, Regional Director, Southwest Region of the U.S. Fish and Wildlife Service, am the designated Authorized Official for the U.S. Department of the Interior for natural resource damage assessment at the MolyCorp Mine Site, Questa, Taos County, New Mexico. The mission of the U.S. Fish and Wildlife Service includes the conservation, protection, and enhancement of fish, wildlife, plants, and their habitats. I have served as Regional Director since 2006, and my responsibilities have touched many aspects of the work of the Service, including, for example: Migratory birds; fisheries; aquatic resources; habitat conservation, restoration and acquisition; and other related conservation issues that affect fish and wildlife resources, including multiple settlements for natural resource damages.

Mr. Russell MacRae and Ms. Karen Cathey both are longtime employees of the U.S. Fish and Wildlife Service; both are entrusted with tasks involving natural resources; both are experienced in that aspect of the work of U.S. Fish and Wildlife Service; both carried out work for the Service concerning natural resources related to the MolyCorp Mine Site and are considered resident experts in that work.

I state under penalty of perjury that the foregoing is true and correct.



Benjamin N. Tuggle, PhD.

Regional Director, Southwest Region

U.S. Fish and Wildlife Service

Department of the Interior

Date: 9/1/2015

Report on Hydrological Connection Associated With Molycorp Mining Activity, Questa, New Mexico

Prepared for:

USEPA, Region 6
NPDES Permits Branch (6WQ-P)

by:

David Abshire
Geologist,
USEPA, Region 6
Groundwater/UIC (6WQ-SG)

Date:

February 13, 1998

EXECUTIVE SUMMARY

This study was initiated following a request from the EPA Region 6 National Pollution Discharge Elimination Systems (NPDES) Permits Branch for assistance in determining if mining activities at the Union Oil of California Molycorp (Molycorp) Questa Molybdenum Mine and associated tailings ponds are a source of contamination to the Red River. Specifically, the request was to determine if these mining activities are resulting in the discharge of acidic, metal laden ground water to surface water via seeps along the Red River through a ground water hydrological connection. The study was conducted by the EPA Region 6 Ground Water Center of Excellence (GWCE). The NPDES Permits Branch supplied several technical reports and correspondence pertaining to the Molycorp site for review. Additional information was acquired from the New Mexico Environment Department (NMED), Molycorp, conservation groups, and a site visit.

With respect to this report, the Molycorp site consists of the actual mine located between the towns of Red River and Questa, New Mexico; and the Questa Valley tailings pond area, located approximately 10 miles downstream from the mine area near the town of Questa. This study focuses on river seeps (ground water flowing gently from the river bank above river water level) in reaches of the Red River adjacent to the Molycorp mining operations and tailings ponds. The seeps are the primary non-point source discharge relative to the NPDES program at these sites. For this investigation, the GWCE evaluated the available geologic, water quality and well test data to determine 1) if ground water and adjacent Red River seep water contamination exist, 2) the probable source for ground water contamination, and 3) if a ground water hydrological connection exists between the source and the contaminated ground water discharged by seeps to the river. As with all reports reviewed during this study, some conclusions in this report are based on the application of scientific principles relative to the issues.

The Red River has 21 perennial tributaries which originate as very high quality mountain streams. Those tributaries which are not near sulfide rich outcrops or historic or recent mining areas remain high quality streams until their confluence with the Red River. The NMED reported that long-time residents considered the Red River pristine prior to mining operations. However, Molycorp contends that its mining operations cannot be the only source for the acidic, high metals seep discharge due to the fact that place names such as Sulphur Gulch, Bitter Creek and Red River allude to the conditions that existed when the region was settled. River water quality in some areas up-river of the mine site is periodically affected by storm events which deliver elevated metals concentrations (above surface water standards) to the river. The NMED states that there are a number of ground water related nonpoint sources of contamination to the river, and that sampling shows that the greatest impact is from acidic, high metals seeps.

Seeps discharge acid rock drainage (ARD) into the river in the mountainous region of the Red River watershed. ARD is characterized by low pH, and elevated concentrations of metals and total dissolved solids (TDS) which typically exceed New Mexico Ground Water Standards (NMGWS). The most common mechanism for its formation involves the oxidation and hydration of sulfide minerals (e.g., pyrite, or iron sulfide) resident in the source rock (volcanic rhyolite).

This chemical reaction results in the generation of sulfuric acid and elevated concentrations of iron. Rhyolite is found in naturally occurring erosional scars within the watershed, and in Molycorp's waste rock dumps (WRDs). The primary metals involved in contaminant transport include; aluminum, magnesium, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, and zinc.

There are two general modes of contaminant transport in the mountainous region (which incorporates the mining area) of the Red River watershed: steady-state, and pulse loading. In pulse loading, large volumes of weathered sulfide rock are periodically transported to stream channels by storm events. Regional sampling conducted by the NMED revealed that metal loading problems associated with pulse events are

largely temporal, and that in most cases a degree of equilibrium is restored to affected stream reaches within a few days. MolyCorp has recently constructed a surface water collection system to capture and redirect most of the runoff within the mining area. This system is designed to reduce pulse loading to this reach of the river. Steady-state refers to the relatively continuous discharge of ground water to the river.

At the mine site, the erosional scar and WRD geochemistry are correlative to the adjacent ground water quality. Constituent correlation also exists between ground water and the discharge at seeps along the river. Data from several monitor wells indicate that the shallow alluvial aquifers are saturated, and that these aquifers have the potential to transport low pH ground water with high metals concentrations to surface water. In addition, United States Geological Survey (USGS) data indicate that this particular reach of the Red River is a gaining stream supplied by ground water. Therefore, the erosional scars and WRDs are most probably hydrologically connected through a shallow alluvial aquifer conduit to the Red River seeps within the mine property.

The tailings ponds contain spent slurry from the mine site. Surface water runoff, which contains ARD, is collected and used for milling operations. The milling operations generate the spent slurry which is then piped to the ponds for disposal. The pond fluid is characterized by low pH and high metals concentrations (i.e., ARD). Although MolyCorp has constructed a surface water drainage system to divert runoff from entering the pond area, sulfate and metals concentrations found in ground water below and down gradient of the tailings ponds exceed NMGWS due to infiltration of pond slurry water containing ARD. Due to the area's gentle surface gradient and the surface water collection system, steady-state (i.e., ground water) appears to be the only mode of transport within the tailings pond area.

A ground water hydrological connection via the shallow alluvial aquifer exists between the tailings ponds and seeps adjacent to the Red River. Seep discharges in this area are characterized by sulfate concentrations slightly above ground water background. However, metals concentrations do not exceed NMGWS or NMSWS at these seeps. River water quality adjacent to the tailings ponds appears to meet New Mexico Surface Water Standards (NMSWS).

According to the NMED, the seeps down gradient of the tailings ponds are part of a continuing MolyCorp monitoring program, which indicates that seep water quality is not deteriorating. MolyCorp has constructed a shallow ground water collection system to capture pond leachate being transported to the river; however, some contaminants bypass this system. MolyCorp is presently installing extraction wells to capture leachate that bypasses the collection system.

In summary, this investigation concluded that the possible sources for the high metals and sulfate concentrations discharged to the river at the mine site are: 1) historic and recent mine waste rock, 2) erosional scars, 3) remnant deposits of tailings resulting from pipeline breaks, 4) a landfill area at the head of Spring Gulch, 5) the Moly tunnel, (6) the caved area in Goathill Gulch, and 7) runoff directed to the underground workings for collection. Of these, the most probable sources are considered to be the WRDs and the erosional scars based upon the results of material analysis and water quality; and that the acidic seeps and these two sources are wide spread while other sources are localized. The only probable source of ground water contamination at the tailings ponds area are the ponds.

The NPDES Program regulates point sources. NPDES regulations (40 CFR, §122.2) define point source as "any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, - from which pollutants are or may be discharged..." A documented ground water hydrological connection between a source and surface water discharge may be viewed as a conduit; or a discernible, confined, and discrete conveyance. To identify the source for surface water contamination, proper sampling and monitor wells are required to verify constituent correlation and a ground water hydrological connection between the source and the discharge to surface water. Support exists for a ground water hydrological connection between a source and surface water

discharge if water quality analysis and monitor well data determine that 1) there is reasonable constituent correlation between surface discharge, source leachate, and ground water; 2) the ground water gradient is to surface water (gaining stream); and 3) aquifer characteristics support a connection. The most probable sources (erosional scars, waste rock dumps, and the tailings ponds) satisfy these requirements. The tailings ponds supply water and elevated metals concentrations to the ground water through infiltration, but no documentation exists for the ponds being a source of river metals concentrations. Therefore, it appears that contaminants in ground water are attenuated prior to the discharge of ground water and pond water to the river in this area. At the mine site, the percentage of metals concentrations or discharge volume supplied to a particular seep by each probable source (erosional scar or waste rock dump) could not be determined using the available information.

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1.0

INTRODUCTION

The objective of this report is to determine the source for the acidic, high metals seeps (ground water flowing gently from the soil) along the Red River bank and to determine if sufficient documentation exists to substantiate a ground water or surface water hydrological connection between the source and seep discharge to the river. Surface water drainage pathways were evaluated to determine if surface water runoff could supply contaminants to the seeps. Monitor well tests and ground water quality data were evaluated to determine if subsurface pathways existed between the source and the seeps.

The Amigos Bravos and New Mexico Citizens for Clean Air and Water conservation groups (hereafter referred to as Amigos et al) contend that the Union Oil of California Molycorp (or Molycorp) excavation and disposal activities at the mine site are the cause for the increase in metals concentrations delivered to the river through a ground water hydrological connection to seeps located along the river bank. Amigos et al, have requested that the Region 6, National Pollution Discharge Elimination System (NPDES), Permits Branch require Molycorp to obtain a permit for this ground water discharge. The New Mexico Environment Department (NMED) considers the acidic, high metals seeps, which exist within the Molycorp mine boundary, the principal cause for metals loading to this reach. In contrast, Molycorp considers the erosion and surface water transport of sulfide rich naturally occurring erosional scar material as the major source of metals loading to the river. Therefore, although all possible sources were evaluated as to their relative metals contribution to surface water, this report concentrates on historic and recent mine sites and natural factors which may be a source for the continuing degradation of the Red River.

The Red River watershed is located in north central New Mexico, Taos County. Studies by the United States Geological Survey (USGS) and others have documented that for most of its length, the Red River is a gaining stream supplied by groundwater. As indicated in Appendix 1, the river is classified in the New Mexico Standards for Interstate and Intrastate Streams from the Rio Grande upstream to the mouth of Placer Creek with the following uses: coldwater fishery, fish culture, irrigation, livestock watering, wildlife habitat, and secondary contact. It has been documented (NMED, March 1996) that Red River standards are most often not attained due to various non-point sources. Its impairment is mainly due to the influx of low pH levels, metals, biological toxins, septic tank effluent, municipal sludge, petroleum products, and sediment loading due to storm events. The most incessant and wide-spread effect to river water quality is from the influx of fluids with low pH and high metals concentrations, which are delivered to the river via ground water transport to seeps along the river and surface water runoff.

As illustrated by [Figure 1](#) and [\[Figure\] 2](#), the Molycorp mining operations include the open pit, old and new underground mining areas, waste rock dumps (WRDs), a mill site and associated tailings piles. The Molycorp mine property is located north of the Red River and Highway 38 between the towns of Red River and Questa and incorporates approximately five square miles. Molycorp began the underground mine workings in 1923 for molybdenum, an element used in strengthening steel. In 1941, mining had extended to such depths that a mile-long tunnel (hereafter referred to as the Moly Tunnel) was constructed to facilitate drainage of the underground workings into the Red River. In 1965, Molycorp abandoned the underground working and switched to open pit operations over the existing underground mine. Within this period, the Moly Tunnel was closed by placing concrete plugs at each end. To obtain access to the subsurface molybdenum deposits, during open pit operations the overlying surface material was excavated and deposited progressively down gradient in canyons as WRDs. Molycorp has covered approximately 500 surface acres near the operations with hundreds of feet of this waste rock material. In 1983, Molycorp ceased open pit operations and commenced new underground mining approximately 4,000 feet southwest of the old location. Mining operations were temporarily suspended from 1986 to 1989 and from 1992 to 1995 due to general economic conditions.

To alleviate the low pH and high metals loadings to the Red River adjacent to the Molycorp mine site, Molycorp (with NMED assistance) dug trenches and installed a series of anoxic alkaline (limestone) filters in

early 1996 at a site along the river (Capulin Canyon) where NMED considers several of the seeps particularly active. Prior to limestone placement, the NMED determined that ground water quality from the trenches was correlative to the adjacent Red River seep water quality. However, after a short period of time, these filters became ineffective in modifying the pH and metals content.

The tailings impoundment is located approximately six miles west of the mine near the town of Questa and incorporates approximately 640 acres. After the molybdenite is extracted at the mine site through milling operations, the spent slurry is pumped out of the mining area through a ten mile pipeline constructed along the Red River to the tailings ponds at Questa. Since 1965, Molycorp has discharged approximately 95 million tons of tailings into the Questa impoundments.

The tailings impoundment, as illustrated on [Figure 3](#), consists of several inactive and two active unlined ponds. The ponds were constructed consecutively within two arroyos by placing earthen dams at the down gradient end of each pond. South Pass Resources (April 13, 1995) reported that the slurry delivered to the ponds consists of 38 percent solids and 62 percent liquids. Standing water in the ponds was originally collected by surface drains and directed to Pope Lake, which is located south of Dam No.4, and then to the Red River. In the 1970's Molycorp installed seepage barriers to intercept seepage and shallow ground water south of Dam No.1 and southeast of Dam No.4. Vail (September 24, 1993) states that these barriers were effective for some time but recent evidence indicates they are less effective in decreasing metals concentrations. In 1983, Molycorp installed an ion exchange facility to process the water at Pope Lake prior to discharging it to the river. An additional drainage system has been installed beneath both dams which consists of chimney drains connected to under drains at the base of the dam. Vail (September 24, 1993) states that Molycorp is presently investigating the feasibility of constructing additional seepage barriers and/or other facilities to substantially reduce the seepage flow down gradient of the tailings ponds in this area.

Several private wells located down gradient of the ponds were used by residents for drinking water purposes. In 1976 Molycorp plugged several of these wells and re-routed service from the Questa community well system due to elevated sulfate and Total Dissolved Solids (TDS) concentrations making private well water unacceptable as a drinking or irrigation source.

The NMED (March, 1996) states that in 1966, in response to Molycorp operations, the United States Department of Health, Education and Welfare conducted a baseline water quality survey of the Red River. The survey revealed that although there was periodic metals loading due to storm events from small historic mine sites adjacent to the river, the overall river water quality was determined to be good to exceptional. In 1971, the EPA determined the chemical water quality of the river remained good except for contamination resulting from occasional breaks in the tailings pipeline. However, in the same time period, the New Mexico Department of Game and Fish discovered the absence of a once thriving fish population in the reach adjacent to the mine. A 1982 EPA study concluded that the river was substantially impaired from metal loading, but no definitive source was determined. The NMED (March, 1996) reports that in 1984, the Bureau of Land Management documented pollution sources and found a downstream increase of various constituents, which at times exceeded water quality standards, and determined the major impacts on water quality were due to mining activities.

As indicated by [Figure 2](#), there are three National Pollution Discharge Elimination System (NPDES) permitted point sources (outfalls) within the Red River watershed: the town of Red River treatment plant, the trout hatchery at Questa, and one permit for four Molycorp discharges (two outfalls at the tailings ponds (Questa) and two at the mine site). The NMED (March 1996) concluded that only the waste treatment plant discharges upstream of the most impacted reach of the river, with the effluent considered good quality. The hatchery is downstream of the impacted portion of the river, with its effluent apparently improving river water quality through dilution.

2.0

INVESTIGATIVE APPROACH

Molycorp operates within two topographically diverse areas of the Red River watershed. As illustrated by [Figure 4](#) and [\[Figure\] 5](#), the mining operations are located within a mountainous region. The tailings ponds are located within the Questa valley, which is an area of low relief ([Figure 3](#)). Due to differing depositional environments; aquifers in each area have different relief, intrinsic characteristics (grain size, porosity, etc.) and ground water chemistry. In addition, surface gradient and vertical hydraulic conductivity dictate the percentage of precipitation which will infiltrate to recharge ground water. Therefore, the tailings ponds and mining area were evaluated separately.

Reports on sample studies and historic observations from Molycorp, conservation groups, and the NMED were reviewed to determine if sampling methodology, surface/subsurface geology and historic research were adequate to identify the probable sources for the acidic, high metals Red River seeps in these areas. Available data for this evaluation consisted of 1) pre and post-mining topographic maps; 2) ground water data (well tests, depth to water, and quality); 3) whole rock and soils geochemistry; 4) water quality analysis of, selected natural spring and Red River seeps (historic data limited); 5) historic and recent Red River water quality data (historic data limited); 6) subsurface lithologic data; and 7) climatological data. Historic and recent aerial photographs were not available for review. The NMED states that aerial surveys are sparse and do not indicate any relevant data. Chemical constituents found in ground water and surface water samples were compared to New Mexico Ground Water Standards (NMGWS) and New Mexico Surface Water Standards (NMSWS) in establishing if ground water or surface water contamination did exist (see Appendix 1 and Appendix 2 for relevant data on NMGWS and NMSWS). In so doing, it was assumed that acceptable sampling methodology was employed and that samples are representative of the immediate area.

The NMED (March, 1996) reports that acidic, high metals seeps at the mine site exist only on the north side of the Red River. The majority of seep and spring discharge and field drainage occurs north of the river at the tailings ponds. Therefore, although a general evaluation was conducted in the Red River watershed to determine the source location, this investigation concentrated on the geology and hydrology north of the river. The following investigative approach was the most appropriate in determining the source for high metals and sulfate buildup within the Red River watershed:

- 1) Red River water quality was evaluated to determine the general area of the source. Degradation of a particular reach of a drainage system, or a marked decrease (spike) in water quality at a specific sample location along the river would indicate that the source exists in the general area. Degradation of a small portion of the river would indicate a specific source. However, if contamination was discovered to be wide spread, more than one source or a large source could be expected. A concentration of seeps in a particular area was used as an additional indicator of source location.
- 2) Surface topography, within the general area of the source, was evaluated to define surface water pathways to the Red River. All possible sources within surface flow paths (i.e., subwatersheds) to the river were evaluated to determine their possible metals contribution to the river.

- 3) Available source leachate quality was evaluated to determine the geochemical fingerprint of each possible source. A geochemical assessment of each source was performed to determine its capability to discharge high metals concentrations to ground water, and in concert with a geochemical assessment of ground water and seep discharge, determine the specific source location.
- 4) Near-surface geology and subsurface strata and hydrogeology were evaluated to determine if a ground water hydrological connection exists between the probable source and the river. A knowledge of the local depositional environments leads to a better understanding of an aquifer's capability to deliver ground water to surface water.
- 5) Spring and seep water quality, monitor well tests, and ground water quality are of particular interest in documenting a hydrological connection between a most probable source and seep discharge. Background surface water and ground water samples were evaluated to determine if only natural sources are the cause of degradation to the water system. Monitor well tests were used to characterize the aquifer's ability to act as a conduit for transport of contaminants from a source to surface water. Spring, seep and ground water samples were utilized to identify a chemical correlation to a particular source.

3.0

TAILINGS PONDS AREA

Documentation for several geologic and hydrologic conclusions were omitted from some of the reports reviewed for this study. Therefore, a concentrated evaluation of pond water and associated metals concentrations (hereafter referred to as leachate), ground water and Red River water quality was considered the principal approach in determining if pond leachate has impacted the ground water and the river. Water samples from pond leachate and ground water down gradient of the ponds were evaluated to determine if a chemical correlation existed, and therefore, establish a tailings pond source for immediate ground water contamination. Seep, spring, field drainage and ground water quality, which are summarized on [Table 1](#) and [\[Table\] 2](#), were evaluated to determine if a correlation existed, and if so, establish a ground water hydrological connection between the source, and seep, spring (artesian) and field drainage (groundwater seeping onto the surface of the ground). Attenuation is a factor in ground water transport. Therefore, utilizing background ground water quality, and seep/spring/field drainage water quality was evaluated to determine if pond leachate still affected the water quality at the seep/spring/field drainage locations.

Ground water data from Molycorp's peizometers and shallow alluvium monitor wells indicated that tailings pond leachate has affected the ground water quality down gradient (towards the Red River) of the ponds. Peizometers have documented infiltration of ponds leachate to the shallow aquifers below the ponds and dams. Although attenuation through ground water transport is a factor in this area, monitor wells document ground water flow from the ponds to the river. As a consequence, Molycorp is presently installing capture wells to intercept ground water between the tailings ponds and the river.

Data concerning the question of whether or not the tailings ponds are hydrologically connected to the Red River were limited to those found in Vail (September 24, 1993) and South Pass Resources, Inc. (April 13, 1995). The South Pass Resources, Inc. (SPRI) report contained monitor well test and ground water quality data and descriptions of the lithology encountered by a select number of wells. Screened intervals for several wells were not supplied in the report. However, focusing on wells with complete information

regarding separate aquifer systems; ground water chemistry, velocity, and direction; and barriers to ground water flow; the shallow aquifers were determined to be the primary conduit to the river. A few monitor well tests discussed within the narrative of the SPRI report were not available within the study for review. Vail conducted a hydrological study of the area using USGS stream data; surface, seep, and monitor well water quality data; and tailings pond leachate quality data. Vail has identified volumes and quality of tailings pond leachate delivered to the Red River, and therefore, has documented a hydrological connection between the ponds and Red River.

In reviewing the previously mentioned investigative approach, more weight was given to a geochemical assessment in determining a ground water hydrological connection to the river. The reason for this is related to several factors which affect the water level and water quality results for all monitor wells, and therefore, the geochemical assessment was deemed to be more reliable. These factors include: 1) ground water chemical reactions with materials used for construction of monitor wells; 2) monitor wells screened in hydraulically separated aquifers, which lead to problems in defining area aquifer systems; 3) location of monitor wells relative to barriers (i.e., faults, etc.), which may re-direct or impede ground water flow; 4) different sample periods (e.g., spring, winter, etc.), which lead to ground water quality and elevation differences; 5) hydraulic head in the ponds relative to the dilution potential of the underlying aquifers; and 8) sampling methodology.

3.1 GENERAL AREA OF SOURCE

As illustrated on [Figure 3](#) and summarized in [Table 1](#) and [\[Table\] 2](#), river water samples, collected by Vail (September 4, 1993), were collected from up to down gradient of the tailings ponds. The permitted discharge from outfall 002 and 003 was considered in evaluating river water quality. No definitive change or spike in sulfate or metals concentrations was observed from up to down gradient of the ponds, which indicated that river water quality could not identify the source location. However, as indicated by [Table 1](#) and [\[Table\] 2](#), a correlation did exist between seep/spring/field water quality, ground water quality, and pond leachate chemistry; which indicated the tailings ponds as the probable ground water contaminant source.

3.2 POTENTIAL SURFACE PATHWAYS FOR CONTAMINATION

The surface topography is a sloping alluvial plain, with surface gradient being generally to the Red River. It appears that no surface runoff avenues to the Red River exist south of the tailings ponds due to the construction of dams and barriers. Drainage ditches were constructed up gradient of the tailings ponds to divert natural runoff from entering the pond area.

3.3 SOURCE GEOCHEMICAL CHARACTERIZATION

As evidenced by surface discharge and ground water samples collected by SPRI (April 13, 1995), the area's alluvial and volcanic deposits, which include the aquifers considered hydrologically connected to the river, cannot geochemically account for the metals and sulfate concentrations observed in ground water down gradient of the ponds, or the sulfate concentrations observed at the seeps/springs/field discharge. The ground water at monitor well number 10 (MW-10), as seen on [Figure 6](#), is the best water quality within the area (TDS 150 mg/l, sulfate 35 mg/l). Because of this, and the fact that the well is located east of the ponds, where it is evidently outside of the influence of pond infiltrate due to a ground water flow direction to the southwest, samples taken from this well are considered to be indicative of ground water quality before mining activities took place (i.e., background). In comparison to the samples taken at MW-10, several ground water samples south of the ponds show moderately elevated concentrations of sulfate, TDS, manganese and molybdenum. In addition, there exists no natural source for the elevated molybdenum concentrations found in ground water at MW-2 and MW-C; however, tailings are derived directly from the milling operations for molybdenum. Therefore, the elevated sulfate

and metals concentrations found in ground water are considered to be from the tailings ponds and not from natural sources.

3.4 SURFACE AND SUBSURFACE GEOLOGY AND HYDROGEOLOGY

Establishing a hydrological connection between a source and contaminated surface water requires the evaluation of several hydrogeological parameters. It must be determined that ground water below the source has been affected by infiltration of source leachate and that conduits exist for the ground water transport of this leachate to surface water.

The surface geology was characterized to determine the erosional and depositional factors which may affect the flow directions within the subsurface aquifers. The subsurface was evaluated through monitor well tests and lithologic samples to determine which aquifers may be conduits for ground water flow from a source to surface water. Monitor well tests and lithologic samples were utilized to define individual aquifers (vertical hydraulic separation), aquifer lateral continuity, and to determine the transport capabilities of the aquifers.

3.4.1 SURFACE AND SUBSURFACE GEOLOGY

Surface topography and subsurface geology characterize the area as one of active structural deformation, deposition, and erosion. The structurally active nature of the area is represented by several faults which displace the shallow alluvial and deeper basaltic aquifer deposits. However, this displacement does not appear to halt ground water flow to the river, which is apparently due to the juxtaposition of different but permeable aquifers or juxtaposed impermeable aquifers redirecting ground water flow to the south (to the river).

SPRI (April 13, 1995) used borehole and geophysical logs to characterize the subsurface. The area consists of volcanic rocks, and sedimentary and lacustrine deposits. The upper alluvial and lacustrine deposits (Santa Fe Group) consist of an Upper Aquifer Unit (UAU), Middle Aquitard Unit (MAU), Lower Aquifer Unit (LAU), and Basal Aquitard Unit (BAU). SPRI states that each unit exhibits vertical variation in lithology; each unit containing clay, gravel and sand lenses. The Santa Fe Group overlies a major regional aquifer which exists in the basalts and volcanics (basalt/andesite unit (BAAU)). The UAU (upper Santa Fe Group) underlies Dam No.1. However, only 50 feet of the lower Santa Fe Group exists immediately down gradient of Dam No. 4 because of the erosion of some upper Santa Fe Group units.

3.4.2 HYDROGEOLOGY

Monitor well placement and aquifer tests were used to determine several aquifer parameters including ground water gradient, if vertical hydraulic separation exists between aquifer units, if aquifers have lateral continuity, and if barriers exist to redirect ground water flow. Vertical hydraulic separation would indicate that a basal aquitard does exist. An aquitard would indicate no further migration of contaminants into deeper aquifers, and substantiate ground water transport of pond leachate down gradient. The lateral continuity of a hydrologic unit (one aquifer or juxtaposed aquifers) must be determined to define the conduit (i.e., that the hydrologic unit exists from the ponds to the river) for the ground water transport of pond leachate to the Red River. If hydraulic separation or lateral continuity is established at monitor wells, it is assumed that they exist within the general area of the wells.

3.4.2.1 GROUND WATER GRADIENT AND BARRIERS

SPRI (April 13, 1995) conducted aquifer tests on 3 wells (EW-2, EW-3, and MW-7), which are completed (screened) in separate units of the Santa Fe Group ([Figure 6](#)). Analyses of well tests indicate good conductivity, recharge and localized barriers to flow. Recharge and barriers to flow may be caused by changes in hydraulic conductivity or faults. Monitor well ground water elevations indicate that the ground water flow direction is generally to the southwest in the UAU and the BAAU. Ground water flow

direction for the LAU is unknown; however, it is expected to flow to the southwest because the LAU lies between the UAU and BAAU. SPRI (April 13, 1995) states that USGS stream gage data indicate an overall gain (approximately 30 cfs) between the Questa ranger station and the fish hatchery. Therefore, although faults and juxtaposed units may locally redirect ground water flow, flow is still directed to the river.

SPRI (April 13, 1995) reports that the underdrains (connected to the chimney drains), which were installed to intercept leachate below each dam, would rest on a shallow upper aquifer unit beneath Dam No.1 and probably on the upper sandy member of the basalt aquifer unit at Dam 4 ([Figure 6](#)). Piezometers were installed into the dams to measure the saturated surface to determine the infiltration rate to the underlying aquifers. However, SPRI has only submitted information on the pond leachate infiltration capacity below Dam No.1. The slope of the saturated surface showed discharge to the under drain system beneath Dam No.1. As illustrated on [Figure 6](#) and [\[Figure\] 7](#), piezometers within Dam No.1 and monitoring wells south of the dam document that ground water gradient is to the south from Dam No.1 to at least MW-7. Because the ponds are unlined, the drain system apparently captures some but not all of the seepage through the dam. The remaining leachate enters the underlying shallow aquifer over the area of the ponds and moves down gradient towards the river, thus bypassing the drain collection system.

Ground water levels from monitor wells located south of Dam No.1 and 4 were evaluated to determine the ground water elevation relative to the Red River to establish which portions of the river were a gaining or losing stream. MW-11, located south of Dam No.4, showed water levels below the adjacent Red River level. SPRI (April 13, 1995) states that this situation may indicate river recharge to ground water in this area but not enough to impact the overall gain recorded by stream gages. It must be noted that only one monitor well exists in this area, therefore, ground water gradient in this immediate area cannot be substantiated. For the segment of the Red River between Big Springs and Pope Lake, the water table in the basalt unit appears to be just above river level. MW-1, located south of Dam No.1, showed water levels above the level of the river, indicating ground water recharge to the river. Ground water elevations do establish ground water flow in a general southwest direction (to the river).

3.4.2.2 VERTICAL HYDRAULIC SEPARATION

Vertical hydraulic separation of aquifers was investigated to determine basal aquitards, and in so doing, define the hydrologic unit capable of transporting contaminants to the river. Separate flow systems (vertical hydraulic separation), due to confining clay beds, occur within the Santa Fe Group (shallow alluvial aquifers) and the underlying basalt aquifer. Monitor wells screened in different aquifers show different depths to water indicating vertical hydraulic separation to some degree. Local vertical hydraulic separation can be supported by a pump test conducted by SPRI (April 13, 1995) at monitor well EW-2, which is illustrated on [Figure 6](#). During the EW-2 (screened in upper portion of LAU) pump test, water levels in MW-7C (screened in lower portion of LAU) were monitored. SPRI reports that only minor water level fluctuations (range of 3.2 inches), which SPRI attributes to barometric changes, were observed in MW-7C, indicating that these wells are apparently screened in hydraulically separated lenses of the LAU.

3.4.2.3 LATERAL CONTINUITY

Lateral continuity must be established to document a continuous conduit for ground water flow from the source to surface water. Establishing lateral continuity over a great distance for a specific hydrologic unit is not possible due to the present monitor well scheme. However, local lateral continuity has been demonstrated by the EW-3 pump test. Water levels within MW-7A were monitored during the EW-3 pump test (both screened in the lower UAU). Observed water level fluctuations in MW-7A established a lateral ground water hydrologic connection between MW-7A and EW-3. These tests indicate good hydraulic conductivity and local lateral continuity. The perched nature of some aquifers suggests lateral discontinuity most probably caused by juxtaposition, due to fault displacement, of different aquifers with differing conductivity. Although juxtaposition is assumed due to faulting, ground water flow through the

fault cannot be documented due to the present monitor well scheme. However, fault trend is north-northeast to south-southwest and ground water gradient is to the river, and therefore, ground water flow direction is to the river. In addition, studies of USGS gage station data indicate the river to be a gaining stream supplied by ground water, which indicates that ground water flow is to the river within a major portion of the tailings area.

3.5 RIVER, SPRING, SEEP AND GROUND WATER QUALITY

Pond, river, spring, seep and ground water quality were evaluated to determine if a water quality correlation existed. In doing so, documentation could be established for a hydrological connection from the ponds to the river via ground water transport.

Vail (September 24, 1993) states that tailings pond water and associated contaminants (leachate) seep to the ground water which flows generally in a southwesterly direction and discharges to Red river. This seepage contains elevated concentrations of sulfates (840+-mg/l), molybdenum (2+-mg/l), manganese (1.4+-mg/l), and total dissolved solids (1700+-mg/l). In his discussion of pond leachate avenues below Dam No.1, Vail concluded that this seepage flow is generally in the shallow alluvium. Vail believes that a large percentage of the seepage from Pond No.4 is transported by ground water flow in the volcanic formations and that most of this ground water flow is discharged to Red River at the numerous springs along the Red River Gorge. SPRI (April 13, 1995) reports that the section of the Red River that may be impacted by the tailings ponds is 1.84 miles in length (roughly from the 002/003 Outfall west to the area of the Fish Hatchery)."

3.5.1 RIVER

As illustrated on [Figure 3](#), Vail collected seep/spring and river water samples at several locations between State Road 522 and the Red River State Fish Hatchery. Comparisons of up-river metals concentrations with river water samples adjacent to the ponds suggests that river water quality is not affected by a pond source. For example, river water samples collected from up to down gradient of the ponds show that only a small difference in river metals concentrations, with the most up river sample normally having the greater concentrations. There is a slight influence on river water quality down gradient of outfall 002 and 003 ([Figure 3](#)) due to the permitted discharge. This influence was considered in the evaluation of river water quality. Analysis of submitted river water samples, as summarized on [Table 1](#), and conversations with the State of New Mexico and EPA surface water staff indicate that river water quality is within surface water standards.

3.5.2 SPRINGS

Some Red River springs have sulfate concentrations below NMGWS. Questa Springs, as seen on [Figure 6](#), is most likely due to a north-northeast to south-southwest trending fault which redirects a portion or the total southwesterly flow of ground water to the south (to Questa Springs). Questa Springs water quality has a TDS of 173 mg/l and a sulfate concentration of 80 mg/l, which is just above background (TDS 150 mg/l, sulfate 35 mg/l) and below NMGWS (TDS 1000 mg/l, sulfate 600 mg/l). Questa Springs TDS and sulfate concentrations are lower than ground water concentrations below Dam No.1, which indicates that attenuation through ground water transport is a factor in concentrations delivered to seeps and springs along the river.

3.5.3 SEEPS

Seep water quality (collected by Vail, September 24, 1993, and summarized in [Table 1](#)) was used to some degree as a ground water quality indicator to evaluate the general ground water quality in the immediate area. Two field drainage (field surface seepage) sites immediately south of Dam No. 1 have moderately elevated TDS concentrations; one has elevated sulfate and the other elevated iron concentrations above

NMGWS. One field drainage sample, located midpoint of Dam No.1 and the river, has molybdenum concentrations above NMGWS. These field drainage samples indicate a tailings source. Although sulfate concentrations discharged at Red River seeps are just above ground water background concentrations, which indicate a probable tailings source, they are below NMGWS. These observations are an additional indication that attenuation of pond leachate through ground water transport is a factor in decreasing sulfate and metals concentrations in ground water delivered to seeps and springs along the river.

3.5.4 GROUND WATER QUALITY

Analyses of ground water samples collected below and down gradient of the ponds establishes a correlation between pond leachate, and ground water and seeps/springs/field discharges south of the ponds. Several ground water samples show moderately elevated concentrations of sulfate, TDS, manganese, and molybdenum. The ground water at MW-10 ([Figure 6](#)) is the best water quality within the area (TDS 150 mg/l, sulfate 35 mg/l). South of the ponds, the UAU and upper portion of the MAU usually have high TDS and high sulfate concentrations. The highest sulfate concentrations were detected at MW-C (970 mg/l), a shallow piezometer at the toe of the Dam No.1. The down gradient MW-A has lower sulfate concentrations (560 mg/l) indicating dilution. Piezometer MW-9A, located approximately 1200 feet down gradient (south) of MW-A, has greater sulfate concentrations (680 mg/l) than MW-A. Apparently, inconsistencies between ground water flow direction and ground water quality indicate local attenuation, interflow between aquifer members (dilution), and/or redirection of ground water flow paths. This redirection is most likely due to faults and/or changes in hydraulic conductivity. However, ground water gradient and quality indicate that pond leachate does infiltrate to the UAU and moves down gradient towards the river.

3.6 SUMMARY

A water quality comparison of pond leachate, ground water and seep/spring/field drainage down gradient of the ponds indicates that the only probable source for elevated sulfate and metals concentrations found in ground water are the ponds. However, the available information indicates that ground water discharge via seeps along the river and river water quality are within NMGWS and NMSWS. A complete summary of the tailings ponds and the MolyCorp mine site is found at the end of this report.

4.0

MOLYCORP MINE SITE

The mine site is located in a more complex geologic setting than the tailings pond area. The mine property is located in a mountainous region, which is cut by deep canyons. The extreme topographic gradient was formed through erosion of volcanic flows associated with the Questa caldera (a large crater formed by the collapse of a volcanic cone). As indicated by [Figure 4](#) and [\[Figure\] 5](#), the surface gradient directs surface water runoff, and shallow ground water, to the Red River.

Historic and recent mining operations and natural sources, within the MolyCorp mine area and upriver of the mine, were investigated to determine their potential contribution of metals to the river. Investigations revealed that the possible sources are: 1) historic and recent mine waste rock, 2) naturally occurring erosional scars, 3) remnant deposits of tailings resulting from pipeline breaks, 4) the landfill area at the head of Spring Gulch, 5) the Moly tunnel, (6) the caved area in Goathill Gulch, 7) runoff directed to the underground workings for collection, and 8) the mill site. Of these, the most probable sources are considered to be the WRDs and the erosional scars because of source material and water quality (leachate and ground water) analysis results. An additional indicator of source location is that the acidic seeps and these two sources are wide spread and other possible sources (land fill, Moly tunnel, etc.) are localized.

Approximately 59 historic mine sites exist within seven tributaries of the upper Red River watershed. All of these mines were fairly small operations, with associated waste rock piles being relatively minor. The NMED (March, 1996) states that although these sites contribute some contamination to the river through surface water runoff associated with storm events, none appear to be a significant source of metals loading to ground water or surface water.

4.1 GENERAL AREA OF SOURCE

The most significant water quality degradation occurs within the middle reach of the Red River from Questa to the town of Red River ([Figure 2](#)), which contains the Molycorp mine and most of the major scar areas. River surveys have documented declines in river water quality progressing downstream from the town of Red River. The most acceptable method for determining the general area of the source was the river water analysis for sulfate gain, which used sulfate as a proxy for metals to examine how the loading of metals to the Red River has changed over time.

As illustrated in [Figure 8](#) and summarized in [Table 3](#), Red River water quality data, collected in May 1994 by SPRI (April 21, 1995), indicate a spike in sulfate concentrations. A Red River sample collected just up river of the confluence with Columbine Creek (RR-12) indicates a twofold gain in sulfates compared to up river samples from Hot-N-Tot Creek to just up river of Portal Springs (RR-5 to RR-10). Sample RR-13 shows a decrease in sulfate concentrations due to inflow from Columbine Creek. However, RR-13 concentrations remain greater than up river samples. Red River sulfate concentrations down river of sample RR-13 are generally the same as the RR-12 sample. This area of increased sulfate concentrations is most probably due to the numerous seeps located within and just down river of the Molycorp boundary.

Seeps are considered the primary and most incessant source for metals loading to the river. Consequently, an additional indicator of source location is that the greater percentage of and most active acidic, high metals seeps exist in the vicinity of the Molycorp mine. Therefore, Red River water quality data and seep locations indicate the source to be within the general area of the Molycorp mine property.

4.2 POTENTIAL SURFACE PATHWAYS FOR CONTAMINATION

Surface avenues to the Red River were evaluated to determine the probability of surface water runoff supplying a portion of or the total metals load and ground water discharge to the river via seeps. The surface topography ranges in elevation from approximately 7600 to 10,800 feet within the mining area. Most of the topography consists of very steep slopes. Major tributary canyons have gradients on the order of 11 to 15 degrees. Due to the topographic gradient, unconsolidated nature of the area alluvium, and storm events; sediment and surface water runoff is directed to the river.

As can be seen by comparing [Figure 4](#), [\[Figure\] 5](#) and [\[Figure\] 9](#), the steep gradient within the mountainous region facilitates the formation of erosional scars. Erosional scars are so easily eroded that mudflows are produced by heavy precipitation, creating debris aprons where tributaries enter the Red River. Mudflows have at times dammed the river. However, the NMED (March, 1996) has determined through water quality analysis that metals loading problems associated with these events are largely temporal, and that in most cases river water quality is restored within a few days.

Molycorp has implemented a water management and sediment collection program at the mine site, which incorporates the majority of the mine property ([Figure 4](#)). Surface water within the majority of the mine boundary is redirected to the open pit and caved area (a surface depression within Goathill Gulch canyon caused by the collapse of a portion of the roof of the underground mine) and collected in the underground

mine workings. Apparently, due to the collection system, sediment loading and surface water runoff to the river adjacent to the mine property is not the principal factor in metals loading to this reach of the river.

Molycorp's collection system captures surface water runoff, and spring discharge in unlined catchment basins. The unlined basins undoubtedly allow infiltration to the underlying aquifers. Although a surface system has been installed to intercept surface water runoff and spring discharge, ground water has the potential to bypass the system and flow down gradient to the river. Therefore, the shallow upper valley fill aquifer has the potential to transport high metals concentrations to the Red River. Subwatersheds (canyons), as described below, were individually evaluated to determine if they could function as contamination pathways.

Surface water runoff and seepage from the Capulin Canyon WRDs and erosional scars ([Figure 1](#), [Figure 4](#), and [Figure 9](#)) are collected in surface impoundments. However, ground water flow has not been affected by the collection system and has the potential to transport high metals concentrations to the river.

The Goathill Gulch topography indicates surface and ground water flows to the river. However, a sink, the caved area ([Figure 1](#)), within Goathill Gulch canyon may restrict surface and ground water flow. Apparently, the caved area is a vertical rubble zone of displaced aquifers and bedrock material, which extends from the surface to the underground mine workings. This rubble zone acts as a conduit between the surface and the underground mine. The caved area may capture most of the surface water runoff from upper Goathill Gulch canyon. The caved area captures and directs surface water to the underground mine, where it is redirected to the mill for milling operations. The caved area may also capture ground water within the immediate area, and in so doing, cause a local cone of depression (not to be confused with the cone of depression caused by the dewatering of the open pit and underground workings).

All Goathill Gulch ground water, up gradient of the caved area, may be captured by the caved area. However, no information is available to indicate whether the shallow aquifers have been sufficiently displaced (due to the collapse of the stratigraphic section) such that all up gradient ground water is captured by this area. SPRI (April 21, 1995) states that mounding of the water table surface may occur due to redirection of surface runoff to the caved area, and that the water mound might extend to the valley fill in Goathill Gulch from which it could more easily reach the river. Surface water runoff down gradient of the caved area is intercepted by the surface water collection system. However, no subsurface collection system exists down gradient of the caved area. Therefore, if up gradient ground water is captured by the caved area, subsurface flow is still probable from the caved area to the river. However, the area of ground water available for discharge to the river would be defined by the location of the down gradient outer rim of the local cone of depression, which forms due to the ground water being captured by the caved area. The location of the outer rim is dependent on the depth to the area's undisturbed basement rock, vertical hydraulic conductivity of the rubble (i.e., discharge rate), hydraulic conductivity of lithologic members, and the canyon gradient within the vicinity of the caved area to the river. Therefore, the area of ground water available for discharge to the river, and contaminants from sources within that area, would be from the local depression's southern outer rim location to the river. However, no information exists to define the location of the local cone of depression's outer rim, or in fact, indicate that a local cone of depression does exist.

Surface water runoff from the Sugar Shack South and Middle WRDs is collected in unlined catchment basins. Due to the unlined nature of these catchment basins, leachate from these sources, and the erosional scars which underlie these WRDs, has the potential to infiltrate to the shallow alluvial aquifer and move down gradient to the river.

Natural drainage has been drastically altered in the Sulphur Gulch subwatershed by the placement of Spring Gulch WRD, and Spring and Sulphur Gulch WRD. Surface water runoff is assumed to be captured by the Molycorp collection system. However, surface water can potentially migrate down to the shallow aquifers through infiltration.

There are other unnamed tributary canyons which exist within the Molycorp boundary and direct surface and ground water flow to the river. MW-7 ([Figure 1](#)) is located within a tributary valley which extends up gradient to the Capulin Canyon and Sugar Shack West WRDs. MW-11 and 13 are within minor tributary valleys which were overlaid by the Sugar Shack South and Middle WRDs.

As summarized above, surface water runoff to the river, via canyons, has generally been intercepted by the surface water collection system. Therefore, surface runoff is not considered the primary transport mechanism for metals loading to the Red River.

4.3 SOURCE GEOCHEMICAL CHARACTERIZATION

Mining operations were evaluated to determine the most probable source for the high metals concentrations delivered to the river. In addition, the geochemistry of different rock types within the mine area was evaluated to identify the source with the potential to generate the acidic waters necessary for the leaching of metals. The only whole rock, ground water and seep water quality geochemical data available for review were collected by SPRI (April 21, 1995) and Steffen, Robertson and Kirsten (SRK) (April 13, 1995). The geochemical assessment of possible source leachate and ground water chemistry revealed that the most probable source for the generation of acidic, high metals waters (or ARD) is the WRDs and the naturally occurring erosional scars.

ARD is characterized by low pH and elevated concentrations of metals and TDS. The most common mechanism for its formation involves the oxidation and hydration of sulfide minerals (e.g., pyrite, or iron sulfide), resulting in the generation of sulfuric acid. The mine area rhyolite consists primarily of the mineral pyrite. Rhyolite is exposed north of the Red River as erosional scars. The upper Sulphur Gulch erosional scar (rhyolite) and other non-acid generating rock types were excavated during open pit mining and placed in several WRDs. Therefore, each WRD was evaluated to determine which WRDs contained the rhyolitic material.

A search was conducted to determine if comprehensive WRD disposal records existed to identify WRDs which were composed primarily of rhyolite, and consequently, determine the most acidic, high metals generating WRDs. However, Molycorp has indicated that historical records concerning the development of the WRDs are limited. Generally, mixed volcanic waste rock (rhyolite and andesite) was excavated from the Sulphur Gulch erosional scar area and deposited in the Blind Gulch, Goathill, Sugar Shack South, Sugar Shack West and Middle WRDs and the western portion of Spring and Sulphur Gulch WRD. The remaining waste rock was derived from black andesite, aplite and granite, which are considered to have low potential to generate acidic waters. The majority of this waste rock was placed in the western portion of Spring and Sulphur Gulch, in Spring Gulch and within the pit. SRK (April 13, 1995) states that later in the open pit operations, this waste rock was used to encase the lower faces of the Middle, Sugar Shack South and Spring and Sulphur Gulch WRDs. The rhyolite appears to exist in all WRDs. However, the volume of rhyolite within each WRD could not be determined from the available data.

Other minor waste rock areas were also evaluated for acid generating potential. SRK (April 13, 1995) reports that waste rock from the new underground mine workings, considered non-acid generating, was placed in lower Goathill Gulch, adjacent to the surface facilities. The historic tailings piles at the mine's mill site exhibit acid generating potential, and therefore, have the potential to generate ARD.

The NMED (March, 1996) and SRK (April 13, 1995) conducted a geochemical analysis of waste rock pile, erosional scar, and soils material for metals concentrations. Sugar Shack South WRD has the greatest metals concentrations. ARD from the waste rock is similar in composition to drainage from erosional scar areas. However, leachate analysis, conducted by NMED revealed that average metals concentrations were greater in WRD leachate than scar leachate. SRK states "Over time, ongoing acid generation in the waste rock disposal areas adjacent to the Red River, and the consumption of the neutralizing potential of the

waste rock, and consumption of the remaining attenuation capacity in the alluvium in seepage flow paths has the potential to increase sulfate and metal loads in local springs and seeps. Seepage of water impacted by the hydrothermal scars that underlie the waste rock disposal areas will likely continue" (page 35).

SRK's (September 13, 1995) geochemical analysis of soils outside the influence of erosional scars or WRDs indicates that these soils have low metals leaching potential. Therefore, the dissolved metals contribution to the local environment by these soils is low compared to erosional scars and WRDs. SRK collected soil samples from within the mine area and concluded that the alluvium has the potential to contribute sulfate to surface or ground water, however, the potential for acidic waters is low. Mud and debris from erosional scars outside the mine surface water collection system are considered a localized source of intermittent river contamination through surface flows during periods of high runoff.

Most investigators acknowledge that waste rock material and erosional scars have similar geochemical properties, and that weathering of sulfide-rich erosional scars is associated with acidic, high metals storm water runoff. Although an increase in excavation activity (historic and recent mining, unpaved roads, etc.) appears to be related to the metals buildup in the watershed, the natural processes of weathering are the primary cause for the leaching of high metals into the local watershed environment. Natural weathering of sulfide-rich erosional scar material is relatively slow due to its compacted nature. However, when this material is excavated and placed in thick unconsolidated piles (i.e., WRDs), a large sulfide rich surface area is exposed to oxidation. The unconsolidated WRDs undoubtedly allow greater infiltration rates than the more consolidated natural soils or erosional scars. Therefore, the WRDs should have greater acid generation potential, storage capacity, metals transport capability; and consequently, greater recharge to the underlying aquifers than erosional scars. The upper valley fill aquifer should be saturated below and down gradient of the WRDs due to the recharge.

4.4 SURFACE AND SUBSURFACE GEOLOGY AND HYDROGEOLOGY

An evaluation of the surface geology and topography was performed in order to understand the erodibility and depositional factors at work in the area. Surface geology was evaluated to determine the erodibility and infiltration capabilities of differing rock types to define their relative contribution of alluvium within the subwatershed and recharge potential to ground water. The subsurface geology was evaluated to define the limits and avenues to ground water flow. Monitor well tests were used to determine the hydrogeological controls which influence flow direction and volumes delivered to seeps.

4.4.1 SURFACE AND SUBSURFACE GEOLOGY

The mine area geology is characterized as volcanic. Precambrian granite is exposed south of the Red River. The outcrops north of the river are primarily exposed Tertiary rhyolitic intrusive plugs (erosional scars). The primary hydrologic units north of the river are the fractured Tertiary volcanic bedrock (encountered by monitor wells between 60 - 120 feet below surface) and the overlying lower and upper valley fill alluvium. Several studies indicate that the Precambrian, which underlies these units, acts as an aquitard precluding any deeper ground water infiltration.

The rhyolitic erosional scar is a brecciated rock, which is easily eroded due to a lack of cementation and its highly fractured nature. Its erodibility is one source of alluvial deposits down gradient of scars. Molycorp drilled several 90 foot holes into erosional scars within the area (see SPRI April 21, 1995), apparently to determine the scar's discharge, storage and infiltration capacity. Molycorp found that the scars were either dry or produced very little discharge (less than one gallon per minute), which indicated near surface storage, with little to no infiltration at depth. The infiltration rates for the highly unconsolidated WRD material therefore exceeds that of the more consolidated erosional scar material. Thus, due to the similar geochemical properties of erosional scars and WRDs, the unconsolidated WRDs pose a greater ground water contamination potential than scars.

The steep slopes within the area encompass a greater surface area than the canyon floor. Runoff and ground water flow from the slopes are directed to the canyon floor deposits. The canyon aquifers are saturated due to infiltration through the unconsolidated alluvium. The shallow alluvial aquifers presumably have good lateral flow due to their unconsolidated gravel/sand mix and gradient, and less downward flow due to a basal clay aquitard. Therefore, surface water should infiltrate to the shallow aquifer and move down gradient along the clay aquitard to the river.

4.4.2 HYDROGEOLOGY

Twelve monitor wells were installed in July and August of 1994 ([Figure 1](#) and [\[Figure\] 4](#)). All wells are located within the Molycorp property and between 400 to 700 feet north of the Red River. The wells were installed to determine: 1) aquifer characteristics, 2) ground water gradient and barriers, and 3) ground water quality. A number of these wells indicate separate hydrologic units, and a possible cone of depression created by the dewatering of the open pit and underground mine workings. In addition, studies of USGS gage station data, and ground water elevations (relative to river elevation) obtained from monitor wells and two mine shafts, indicate that the river is supplied by ground water (i.e., gaining stream) throughout most of its length.

It appears that all investigators agree that there are two aquifers in the mine area: a valley fill and an underlying shallow fractured bedrock aquifer. Based on analysis of monitor well data supplied by SPRI (April 21, 1995), EPA believes that at times three different ground water aquifer systems may exist: a shallow fractured bedrock, an overlying lower valley fill, and an upper valley fill aquifer. It must be noted that monitor well tests only determine the hydrologic parameters within the immediate area of the well. However, considering that the alluvial deposits are confined to a relatively small canyon area, an assumption that the hydrologic parameters determined from monitor well tests are indicative of the general lower canyon area is acceptable.

Well tests confirm a weak hydraulic separation between the bedrock and lower valley fill stratigraphic units. Although bedrock and lower valley fill ground water elevations indicate these units may act as one hydrologic unit (one aquifer), well tests also confirm that the valley fill has greater horizontal hydraulic conductivity than the bedrock unit. Therefore, the lower valley fill may act to some degree as an independent aquifer during periods of high recharge. Well tests support some vertical hydraulic separation of the upper valley fill and lower valley fill aquifers by an intermediate clay layer. The clay layer retards further downward flow of upper valley fill ground water. The gradient on the upper surface of the clay layer is apparently to the river due to the depositional environment, and therefore, ground water flow is towards the river.

Monitor well ground water elevations relative to river elevations indicate that a cone of depression, centered on the open pit or underground mine, may exist north of the river. As discussed in Section 4.4.2.1, the cone of depression may affect the bedrock and lower valley fill aquifers between the monitor wells and the open pit and new underground workings, but not the upper valley fill aquifer. Therefore, the upper valley fill has the potential to transport contaminants to the Red River. The bedrock and lower valley fill ground water located outside the influence of the suspect cone of depression, still has the potential to flow to the river.

The NMED (March, 1996) states that shallow bedrock fractures support preferential ground water flow to Red River seeps. Although geologic observations imply fracture orientation, faults intersecting the shallow bedrock aquifer may redirect ground water flow. Ground water elevations in MW-7 indicate a perched nature to the fractured bedrock aquifer in the immediate area. Therefore, support exists for faults or other geologic impediment to retard or redirect ground water flow.

Monitor well data and the steep surface topography support a distinct ground water flow system to the river via the upper valley fill aquifer. Although monitor well data indicate that a cone of depression may exist in an area north of the river, and that the cone of depression may affect the bedrock and lower valley

fill aquifers, ground water south of that area still has the potential to flow to the river via all aquifers. However, the upper valley fill aquifer is a separate system, apparently unaffected by the cone of depression, and therefore, has the potential to transport acidic, high metals concentrations from a large portion of the mine site to the Red River.

4.4.2.1 GROUND WATER GRADIENT AND BARRIERS

Monitor well ground water elevation and river elevation data were compared to establish if the ground water gradient is to the river, which would indicate that ground water would flow to the river, and consequently, transport contaminants to the river. The presence of seeps, in general, indicates that the ground water gradient for at least one of the aquifers is to the river in the immediate area. In addition, studies of USGS gage station data indicate that throughout most of its length, the Red River is a gaining stream supplied by ground water; therefore, the ground water gradient is to the river. A comparison of monitor well ground water and river water elevations, in the eastern portion of the mine site, may imply sporadic recharge to ground water in this area. Therefore, monitor well data and river water levels in this area were evaluated to define the ground water gradient.

Previous investigators have generally compared monitor well ground water elevations to adjacent river elevations in establishing the ground water gradient. Investigators conclude that ground water and river elevations in the eastern portion of the mine property, in the vicinity of MW-13, 14 and 16, indicate ground water to be at or just below the river level. Ground water elevations below river elevation would indicate that the river is recharging ground water, and therefore, contaminants in ground water would not be discharged to the river. Although not stated, these comparisons of ground water elevation to river elevation may have been made in a direction perpendicular from the monitor well to the river. However, due to the Red River gradient (obtained from submitted topographic maps) within the mine area (approximately 1.2/45 feet, east to west), a comparison of monitor well ground water elevation at a right angle to the river may yield inaccurate information by several feet. Ground water flows down gradient along the axis of the canyon; however, the canyon gradient is not the controlling factor for ground water flow direction in the fan delta deposits. The lower limits of the fan delta deposits conform to the river gradient, which is perpendicular to the canyon gradient. Therefore, ground water flow within the fan delta deposits will not be directly to the river as the canyon gradient would imply; but more along a resultant of the angles of the river and canyon gradients, which is more down-river of the canyon axis. Therefore, a conclusion, based on monitor well water levels, that the river may periodically recharge the ground water in the immediate area may be inaccurate. Although there is insufficient data to document a change in ground water flow direction due to a combination of river and fan delta gradients, it is likely, based on a qualitative examination of the gradient of the river and fan delta deposits, that ground water in fact always flows to the river in the eastern portion of the mine site, and therefore, throughout the mine site. However, because the methodology of the gradient measurements was not supplied, it is not known if this correction was applied. Granted, ground water flow velocity and the size of the fan delta are factors which determine the degree the river gradient would have on diverting the ground water flow direction from the canyon axis.

Subsurface barriers exist which impede or re-direct ground water flow. The ground water elevation in MW-7 indicates a perched nature to the bedrock aquifer, which indicates a barrier to ground water flow, possibly caused by faulting. The low pH and high metals concentrations found in MW-7 indicate a long ground water residence time, which is most probably due to faults. Although barriers may impede flow, ground water does flow to the river.

4.4.2.1.1 CONE OF DEPRESSION

Ground water elevations appear to support a cone of depression (not to be confused with the possible cone of depression caused by the caved area) within the bedrock aquifer which is apparently caused by the dewatering of the open pit and underground mine workings. If the cone of depression does exist, it

would indicate that the ground water gradient (ground water flow direction) for a portion of the mine site would be towards the open pit and underground workings (to the north, away from the river). The cone of depression's outer rim, which defines the point at which ground water flows to and from the center of the depression, appears to exist just north of the monitor wells in the eastern portion of the mine site, near the Middle and Spring, and Sulphur Gulch WRDs. Monitor wells in the western and middle portion of the mine site do not appear to have encountered the cone of depression. Ground water elevations and the very active nature of seeps in these areas indicate that the outer rim of the cone of depression should be north of the river, between the new underground workings or open pit and the monitor wells. However, although a cone of depression may exist north of the river and within the mine site, studies of USGS gage station data and seeps indicate that overall the Red River is a gaining stream supplied by ground water; therefore, ground water flow for at least one aquifer is to the river.

An attempt was made to define the outer rim of the suspect cone of depression and its affect on the hydrologic units within the mine area utilizing monitor well/mine shaft data and historic mine dewatering data. There is insufficient historic dewatering information and monitor well data to define the location of the outer rim of the cone of depression. However, subsequent to the monitor well installations, which are illustrated on [Figure 1](#) and [\[Figure\] 4](#), ground water elevations appeared to indicate that the cone of depression may only affect the bedrock aquifer. This interpretation is supported by the following observations:

- 1) Molycorp contends that the water level within the mine defines the lower limit of the cone of depression at that point. However, there is no indication as to the shallowest elevation ground water is entering the mine. If ground water enters the mine from the shallowest aquifers, the radius of influence of the cone of depression would be closer to the entry point than if water was entering at a deeper point (i.e., less drawdown, less area encompassed by the cone of depression). Therefore, the cone of depression would not have as great an influence on the upper aquifers as the observed mine water levels may suggest. SPRI (April 21, 1995) states that a steep sided cone of depression would probably develop over the deep mine due to the lower hydraulic conductivity at depth. SPRI also concluded that the cone probably did not extend to the river.
- 2) Ground water elevations, from existing monitor wells, for the period February, 1996, to August, 1997, were obtained from Molycorp to evaluate the effects dewatering of the mine had on aquifers. As summarized in [Table 4](#), observed fluctuations in monitor well ground water elevations show an influence from seasonal infiltration. MW-8, 2, 3, 11 and 10 are outside of the cone of depression. Bedrock wells MW-13, 14 and 16 may define the outer rim of the cone. However, subsequent to SPRI's installation and evaluation of these wells (which can be found in SPRI's April 21, 1995 report), MW-13 showed the valley fill saturated but the bedrock aquifer dry, indicating that the cone of depression may affect the bedrock aquifer but not the shallow alluvial aquifer. Therefore, the valley fill is to some degree unaffected by the cone of depression and has the potential to deliver ground water to the river in the immediate area.
- 3) Seeps and springs occur at the upper elevations, which are apparently within the cone of depression. Considering that shallow ground water supplies these seeps and springs, the cone of depression does not affect the shallow aquifers to a great extent. Therefore, ground water gradient for the shallow aquifer, throughout a major portion of the mine site, must be to the river.

The cone of depression apparently does not adversely affect the upper valley fill aquifer. Dewatering of the underground workings ceased between 1992 to 1994. SPRI (April 21, 1995) states that during post-1994 dewatering of the new underground mine workings, there was no noticeable effect on the rates of ground water recharge to the Red River in the vicinity of the mine and that most of the ground water recharge to the river may have come from the upper part of the ground water system. Stability of water levels in monitor wells, as post-1994 dewatering proceeded, supports a steep cone of depression existing over the mine, and that the outer rim of the cone is north of the river. Accepting that the cone of depression exists and that ground water recharge to the Red River is not significantly affected by dewatering of the mine, it is concluded that the shallow upper valley fill aquifer is the most probable conduit between the source and the acidic, high metals discharged to the Red River.

4.4.2.2 VERTICAL HYDRAULIC SEPARATION

Local vertical hydraulic separation between the upper valley fill and underlying aquifers is supported by well test data from MW-2, 11, 13 and 10. MW-13 shows the valley fill aquifer saturated but the bedrock aquifer dry, which establishes vertical hydraulic separation. Aquifer tests at MW-10A (completed in the lower valley fill aquifer) established some vertical hydraulic connection between the lower valley fill aquifer and the underlying bedrock aquifer (MW-10B). However, the aquifer test indicated that the upper valley fill aquifer (MW-10C) appears to be separated from the lower aquifers to some degree due to an intermediate clay layer. This clay layer retards the downward flow of upper valley fill ground water to some degree, allowing two different and sustainable flow systems to exist: the upper valley fill and the lower valley fill/bedrock aquifer. WRD and erosional scar leachate should move downward to the upper valley fill aquifer, along the clay layer, and to the Red River. The lower valley fill and bedrock aquifer may receive some of the leachate over time due to the degree of upper valley fill and lower valley fill hydraulic separation within the immediate area.

4.4.2.3 LATERAL CONTINUITY

Lateral continuity, and good hydraulic conductivity, have been established for the lower valley fill aquifer through pump tests conducted on a select number of monitor wells. However, as previously mentioned, the upper valley fill aquifer is considered the primary conduit for Red River contamination through a ground water hydrological connection. No pump tests have been conducted on the upper valley fill aquifer to determine if lateral continuity exists. However, the upper and lower valley fill deposits (i.e., alluvium) are similar, more so than the bedrock aquifer; and therefore, it is assumed that the hydraulic conductivity and lateral continuity are similar.

SPRI (April 21, 1995) states that most of the bedrock wells went dry during development. This indicates that although lateral conductivity may exist in the fractured bedrock aquifer, the hydraulic conductivity was insufficient to supply recharge to these well. However, the bedrock aquifer well MW-11 was pumped at a rate of approximately 60 gallons per minute (gpm). The MW-10A, lower valley fill well, was pumped at a rate of 140 gpm with little drawdown, indicating recharge balanced discharge. A comparison of these two tests indicates that the lower valley fill aquifer has greater hydraulic conductivity than the bedrock aquifer. The fact that the lower valley fill has good hydraulic conductivity and that it exists above the bedrock aquifer (i.e., nearer the source), the lower valley fill (and consequently, the upper valley fill) has a higher potential than the bedrock aquifer to receive and transport metals to the river in the immediate area of the wells.

4.5 RIVER, SPRING, SEEP AND GROUND WATER QUALITY

Ground water, seep and spring water quality, as shown on [Figure 8](#) and summarized in [Table 3](#) and [\[Table\] 5](#), was evaluated to determine if a water quality correlation exists between WRD or erosional scar leachate and ground water, spring, and Red River seep discharge. Attenuation was considered a factor in water quality delivered to the seeps. However, background samples were compared to all samples evaluated to determine if WRD or erosional scar leachate was present in the seep, spring or ground water samples.

4.5.1 RIVER

Review of the (NMED March, 1996) and Vail (July 9, 1993) studies indicated that although most seep constituent concentrations are usually above NMGWS, mixing of seep and Red River water results in dissolved metals concentrations that are at times diluted below NMSWS. However, during storm events, river metals concentrations are above State standards due to pulse loading. During base flow, river metals concentrations increase due to seep discharge, with some metals precipitating out onto the river bed.

4.5.2 SPRINGS

Although background ground water quality appears to have been excluded from the sampling events, the spring drainage sample CCS-2 ([Figure 8](#)) has relatively low metals concentrations and neutral pH. Therefore, the CCS-2 sample was selected as background ground water quality for evaluating ground water within the mine site.

4.5.3 SEEPS

The NMED (March, 1996) has identified more than twenty seeps along the north side of the Red River between the towns of Questa and Red River. Investigations continue to discover additional seeps along the north side of the river. The Portal Springs seep was discovered by an NMED field survey in January 1994, even after numerous earlier surveys. The most recent river survey found the Milk seep (seep at Waldo Curves) approximately one-half mile up river of the mill site. Utilizing the CCS-2 sample as background ground water quality, available Red River seep water chemistry data appear to correlate to WRD and erosional scar leachate chemistry.

The NMED apparently has identified all seeps within the general area of the Molycorp mine property, and has determined that seeps exist only on the north side of the river, with the most active seeps existing within the Molycorp boundary. Both sides of the river have similar topography; therefore, if seeps exist only on the north side of the river, it must be due to other than natural factors which increase recharge to ground water. The major concentrations of erosional scars ([Figure 9](#)) and historic and recent mining activity are located on the north side of the river. One iron rich seep was located near the town of Red River (approximately 6 miles up gradient of the mine), which the NMED (March, 1996) believes is due to anthropogenic factors. If a connection can be substantiated between anthropogenic factors and the formation of seeps, it may be assumed that subsequent excavation activities could add to the contamination of the watershed.

As illustrated on [Figure 1](#) and [\[Figure\] 2](#), several seeps exist within and just down river of the Molycorp property. However, the NMED (March, 1996) reports that there are three principal seeps which exhibit concentrated discharge and appear to have the most impact on Red River water quality: Capulin Canyon, Portal Spring, and Cabin Spring. The NMED states that water chemistry varies between seeps. However, all are acidic and contain elevated concentrations of TDS, including sulfates, Al, Fe, Mn, Co, Cu, Ni, Zn, Cd, and F, which exceed NMGWS. The most dominant metals in all seeps are Ca, Al, Mg, and Fe, respectively.

Ground water samples, as summarized on [Table 5](#), were collected from monitor wells and compared to the Portal Springs, Cabin Springs and Capulin Canyon seeps. Portal Springs and Capulin Canyon waters appear to be more similar to ground water in the valley fill aquifer than to the underlying bedrock aquifer. All ground water samples have TDS and sulfate concentrations above the concentrations in the Red River seeps, and exhibit a pH lower than seep discharge. The following is a water quality evaluation of each seep and its possible source location.

Portal Springs seep is characterized as calcium sulfate waters with a pH of 4.5 and TDS of 1800. Some correlation is apparent between this seep and well MW-10C (upper valley fill, calcium sulfate waters, pH of 4.7, TDS 1400). However, the correlation between MW-10C ground water and Portal Springs seep waters is not clearly defined. Ground water within the upper valley fill aquifer is expected to flow southwest in this area, following the surface topography. Therefore, the ground water supplied to the Portal Springs seep may originate further east of MW-10 and 11, in close proximity to the Moly Tunnel. No closure data on this mine drainage tunnel were available to determine if it may be a probable source for the Portal springs seep.

There exists no up gradient monitor well to attempt a correlation between ground water and the Cabin Springs seep. This seep is located southwest of the nearest WRD and may be caused by preferential flow paths within the bedrock aquifer. No Cabin Springs seep water quality analysis was available for review.

The Capulin Canyon seeps are located west of the main mining operations and appear to be out of the influence of any probable source (WRD or erosional scar). However, the Capulin Canyon seeps and MW-2 (completed in valley fill) have similar low pH values, with sulfates and metals concentrations being greater in MW-2. This suggests the source for the seeps to be up gradient of MW-2. The most probable source for the Capulin Canyon seep is the Capulin Canyon WRD and scars located within this canyon.

Molycorp contends that erosional scars are the primary cause for metals loading to the Red River. Therefore, erosional scars and seeps outside the influence of WRD leachate were evaluated to determine their potential for the discharge of high metals concentrations to ground water and surface water. As illustrated on [Figure 8](#), three water samples collected from erosional scars and seeps outside of the Molycorp mine boundary (HTS-1, from an erosional scar; and HCS-1 and 2, from ground water seeps) exhibit low pH, moderate to high TDS values, and high metals concentrations. The upper Hanson Creek seep (HCS-1, near a scar) has lower pH and higher metals concentrations than the down gradient (HCS-2) seep, indicating attenuation. Although the weathering of excavated rhyolitic material may be a source for high metals buildup within the Red River watershed, the available information does not indicate whether historic mine sites are located near these erosional scars or seeps. Therefore, erosional scars have the potential to release high metals concentrations to the local watershed. Red River samples, down gradient of the Hanson Creek tributary, showed that dilution had decreased metals concentrations and increased pH.

The unconsolidated WRD material appears to deliver greater concentrations of dissolved metals to the ground water than the consolidated erosional scars. The GHS-3 seep ([Figure 8](#)) at Goathill Gulch is from an erosional scar and near the Capulin canyon WRD. SPRI (April 21.1995) states that this erosional scar extends below the Capulin Canyon WRD, and that the GHS-3 chemistry may reflect a mixture of erosional scar and WRD seepage. The HCS-1 and HTS-1 seeps are also within erosional scars. The GHS-3 seep has greater TDS concentrations, and higher metals concentrations; with sulfates, aluminum and magnesium concentrations being two to nine times greater than the HCS-1 and HTS-1 (erosional scar) seeps. This indicates that the additional WRD material increases the concentrations delivered to the underlying aquifer, well above those concentrations contributed by the erosional scar. Although WRD leachate can supply greater metals concentrations to ground water than erosional scars, erosional scars can also release high metals concentrations to ground water which may discharge to local surface water.

Water samples GHS-1, from Capulin Canyon WRD seepage (considered the worst water quality sample reviewed); GHS-2, from a nearby borehole; and GHS-3 are similar. This correlation supports a hydrological connection between waste rock dump seepage and the immediate ground water.

Hutchison (April 23, 1997) contends that natural factors cause the Red River seeps and if ground water contamination did exist, it would not effect the river due to attenuation. Samples GHS-1, GHS-2 and GHS-3 appear to substantiate ground water contamination from Capulin Canyon WRD infiltration. Red River seep water quality indicates that although attenuation appears to be a factor in seep discharge concentrations, seeps considered hydrologically connected to the probable sources (WRD and erosional scar) discharge high metals concentrations to the river. In addition, ground water samples from monitor wells and anoxic alkaline trenches (located immediately up gradient of seeps) document that ground water has a lower pH and higher concentrations of metals than the hydrologically connected seep discharge, indicating that seep discharge is not a true indication of immediate ground water quality.

4.5.4 GROUND WATER QUALITY

Generally within the valley fill aquifer, ground water acidity, sulfates, and metals concentrations increase down gradient along the river. However, bedrock well MW-7 has the lowest pH and highest sulfate, TDS, and metals concentrations recorded; with much greater values than the other ground water wells. The MW-7 water quality values are similar to the Capulin Canyon and Goathill Gulch (CCS-1 and GHS-1) waste rock seepage concentrations. The perched nature of the bedrock aquifer in the immediate area apparently causes a longer ground water residence time, and therefore, greater concentrations.

The remaining bedrock wells have a pH around 7.0, with the exception of MW-11 (pH 5.6), which is completed below the South Sugar Shack waste rock dump. MW-10B (bedrock well, 7.9 pH) is located immediately down gradient of MW-11 and exhibits lower concentrations of metals than MW-11. The low pH and high metals concentrations for MW-11 is probably a result of infiltration from the WRD. MW-10C (upper valley fill aquifer) water quality (pH 4.7) and ground water level indicate that the upper valley fill aquifer appears to be hydraulically separated from the lower aquifers to some degree. Therefore, there exists support for a ground water flow direction toward the topographic low (the Red River) within the upper valley fill aquifer.

5.0

CONCLUSIONS

The most probable sources for the continuing degradation of the Red River watershed through seep discharge of high metals concentrations are the MolyCorp WRDs and the naturally occurring erosional scars. The "most probable" source, indicating that it is the source within a reasonable degree of certainty, has been a defensible argument in the past through specific sampling for verification. Verification of a source requires a comparison of a suspect facility's product or waste stream constituents with contaminants found in ground water and/or surface water. If a correlation exists between facility constituents and contamination, additional support for a hydrological connection is required through water quality, geological and monitor well evidence.

5.1 TAILINGS PONDS

Water quality samples collected from tailings pond leachate, ground water, and Red River seeps indicate that the only probable source for elevated sulfate and metals concentrations found in ground water in this area are the tailings ponds. Ground water samples, which were collected from up and down gradient of the tailings ponds, document infiltration of pond leachate to the underlying shallow alluvial aquifer. A correlation exists between ground water quality below and down gradient of the ponds. Monitor well ground water elevations show a ground water gradient to the river. USGS gage station data indicate the reach adjacent to the tailings ponds is a gaining stream supplied by ground water. Therefore, support

exists for a ground water hydrological connection between the ponds and the river. However, although several ground water samples taken immediately down gradient of the ponds show sulfate and metals concentrations above NMGWS, seeps along the river discharge concentrations below NMGWS and

NMSWS. There is insufficient information to document a ground water discharge of metals concentrations above NMGWS and NMSWS to the river in this area.

5.2 MOLYCORP MINE SITE

Naturally occurring erosional scars (exposed and located below some WRDs) and WRDs are the most probable sources of low pH and high metals discharge to the local watershed environment. Red River water quality and a localized concentration of acidic, high metals seeps indicate that the general area of the source is within the Molycorp boundary. Geochemical analysis of erosional scar and WRD leachate indicates similar geochemical signatures. Monitor well ground water samples support a correlation between ground water chemistry and WRD and erosional scar leachate chemistry. USGS gage station data indicate ground water flow to the river. Although attenuation appears to be a factor for seep discharge, a correlation exists between seep and ground water quality. Therefore, verification has been adequately established to support a ground water hydrological connection between the two sources and Red River seep discharge. However, the percentage of constituent concentrations or discharge volume supplied by each probable source to a specific seep could not be determined using the available data.

6.0

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TABLE 1 (1 OF 2) (TAKEN FROM VAIL, October 1994)

WATER QUALITY SURVEY ALONG RED RIVER
BETWEEN STATE ROAD 522 AND FISH HATCHERY
APRIL 12, 1993

<u>SAMPLE SOURCE</u>	<u>PH</u>	<u>TOT ALK</u>	<u>F</u>	<u>TDS</u>	<u>SO4</u>	<u>TSS</u>	<u>MO</u>	<u>DIS. AL</u>	<u>CD</u>	<u>SUS. AL</u>	<u>FE</u>	<u>PB</u>	<u>CU</u>	<u>ZN</u>	<u>MN</u>
#1 R/R Below Highway Bridge	7.23	38	0.84	255	119	31	<.03	<.5	<.005	7.80	0.594	<.1	0.036	0.250	[unk]
#2 Spring N. Side R/R	6.76	90	0.55	247	92	20	<.03	<.5	<.005	0.50	0.543	<.1	0.007	0.021	0.020
#3 Field Drainage to R/R 500' E. of 002	7.44	99	0.60	246	92	7	0.20	<.5	<.005	<.5	0.405	<.1	<.005	0.047	0.050
#4 Field Drainage to R/R 450' E. of 002	8.22	94	0.46	648	172	6	<.03	<.5	<.005	<.5	0.115	<.1	0.008	0.012	0.050
#5 R/R 300' E of 002	7.60	43	0.90	240	118	22	<.03	<.5	<.005	8.00	0.569	<.1	0.028	0.222	0.880
#6 Outfall 002	7.26	152	1.90	1764	840	2.0	1.80	<.5	<.005	<.5	0.102	<.1	<.005	0.010	1.400
#7 Field Drainage 75'W of 002	7.20	165	0.80	727	228	39	0.20	<.5	<.005	2.70	1.090	<.1	0.009	0.017	0.030
#8 R/R above Questa Spring	7.14	50	0.88	268	141	21	<.03	<.5	<.005	6.20	0.573	<.1	0.029	0.207	0.880
#9 Near Questa Springs SE of Conc. Box	7.02	158	0.38	1094	504	88	<.0	<.5	<.005	8.50	2.940	<.1	0.016	0.047	0.070
#10 Near Questa Springs End of Old Pipe	7.50	177	0.60	576	210	7	<.03	<.5	<.005	<.5	<.05	<.1	0.005	0.010	0.010
#11 R/R 500' W of Questa Springs	7.45	54	0.90	269	138	22	<.03	<.5	<.005	3.10	0.618	<.1	0.033	0.215	0.880

TABLE 1 (2 OF 2) (TAKEN FROM VAIL, October 1994)

WATER QUALITY SURVEY ALONG RED RIVER
BETWEEN STATE ROAD 522 AND FISH HATCHERY
APRIL 12, 1993

<u>SAMPLE SOURCE</u>	<u>PH</u>	<u>TOT ALK</u>	<u>F</u>	<u>TDS</u>	<u>SO4</u>	<u>TSS</u>	<u>MO</u>	<u>DIS. AL</u>	<u>CD</u>	<u>SUS. AL</u>	<u>FE</u>	<u>PB</u>	<u>CU</u>	<u>ZN</u>	<u>MN</u>
#12 Spring - N Side R/R Sta. 47 + 20	6.94	82	0.80	271	115	47	<.03	<.5	<.005	1.70	2.360	<.1	0.011	0.046	0.130
#13 R/R sta. 47 + 70 Above Hatchery	7.45	51	0.90	259	128	22	<.03	<.5	<.005	3.00	0.590	<.1	0.026	0.206	0.830
#14 Spring S. Side R/R Sta. 36 + 80	8.14	82	0.80	304	126	<1	<.03	<.5	<.005	<.5	<.05	<.1	<.005	0.005	0.010
#15 Spring N. Side R/R Sta. 36 + 40	7.26	80	1.10	145	20	<1	<.03	<.5	<.005	<.5	<.05	<.1	<.005	<.005	<.0
#16 R/R Sta.	7.80	49	0.90	247	129	24	<.03	<.5	<.005	3.10	0.527	<.1	0.024	0.191	0.781
#17 Hatchery Inlet Cold Water	7.14	43	0.64	176	80		<.03	<.5	<.005	<.5	0.138	<.1	<.005	<.005	<.0
#18 Hatchery Inlet Warm Water	7.87	77	1.10	284	63		<.03	<.5	<.005	<.5	0.181	<.1	<.005	0.010	<.0
#19 Seep Water in Irrigation Ditch Above 002 Line X @ Road	7.73	174	0.54	1304	660		<.03	<.5	<.005	<.5	0.160	<.1	<.005	0.013	0.050
#20 Molycorp Drain Below Culver Above Ditch	8.10	153	1.90	1702	790		1.70	<.5	<.005	4.00	2.400	<.1	0.016	0.010	2.000

TABLE 2
1994 MONITOR WELL WATER QUALITY DATA FOR TAILINGS AREA
 MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 1 of 3)

MONITOR WELL	SAMPLE DATE 1994	WELL TD (feet)	Corrected DEPTH TO WATER (feet)	DEPTH TO PUMP INTAKE (feet)	pH(1)	CONDUCTIVITY (1) (µmhos)	TEMP (1) (°C)	CARBO-NATE (mg/L)	BICARBO-NATE (mg/L)	HYDR-OXIDE (mg/L)	TOTAL ALK (mg/L)	CHLOR DE (mg/L)	FLUORIDE (mg/L)	NITRATE (mg/L)	SULFATE (mg/L)
EW-1	7-Nov	157	83.00	102	7.50	1,460	NA	<1	156	<1	156	23	0.25	0.72	620
EW-2	8-Nov	204	147.91	170	7.48	850	12.9	<1	122	<1	122	4.8	0.49	0.2	96
EW-2	17-Nov	NA	NA	NA	NA	NA	NA	<1	118	<1	118	4.6	0.5	0.38	90
EW-3	8-Nov	78	57.74	70	7.48	1,135	11.4	<1	110	<1	110	17	0.16	0.6	440
EW-3	19-Nov	NA	NA	NA	NA	NA	NA	<1	136	<1	136	18	0.19	0.49	410
EW-4	7-Nov	58	18.49	50	7.78	650	11.6	<1	152	<1	152	26	0.21	0.35	150
EW-4	16-Nov	NA	NA	NA	NA	NA	NA	<1	156	<1	156	26	0.2	0.36	160
MW-1	7-Nov	100	53.17	80	7.28	1,322	NA	<1	136	<1	136	14	0.27	0.45	610
MW-2	7-Nov	80	22.07	60	7.96	1,701	NA	<1	80	<1	80	15	0.96	<0.06	860
MW-3	8-Nov	60	19.97	55	7.38	1,679	12.4	<1	183	<1	183	18	0.44	0.31	780
MW-4	8-Nov	96	40.77	65	7.61	1,157	12.3	<1	184	<1	184	7.3	0.73	0.24	460
MW-7A	7-Nov	90	58.84	80	7.50	1,565	11.9	<1	126	<1	126	16	0.18	0.72	730
MW-7C	9-Nov	146	111.79	135	7.10	2,160	12.4	<1	124	<1	124	16	0.17	0.32	790
MW-9A	8-Nov	44	26.30	35	7.32	1,021	13.1	<1	174	<1	174	20	0.44	0.33	680
MW-10	8-Nov	129	26.23	100	8.16	236	12.3	<1	77	<1	77	1.6	0.36	0.27	35
MW-11	9-Nov	249	191.93	210	7.00	440	19.8	<1	82	<1	82	10.3	1.28	0.39	58
MW-11AB	9-Nov	NA	NA	NA	NA	NA	NA	<1	79	<1	79	10.1	1.29	NA	58
MW-12	7-Nov	234	128.11	210	NA	NA	NA	<1	120	<1	120	5.1	0.46	NA	66
MW-A	7-Nov	38	30.58	NA	7.28	1,332	NA	<1	154	<1	154	14	0.35	0.37	560
MW-C	7-Nov	14.5	1.80	NA	7.24	1,901	NA	<1	185	<1	185	19	1.16	<0.06	970
CH	8-Nov	NA	NA	NA	7.97	539	13.5	<1	206	<1	206	2.3	0.71	0.44	75

NOTES:

(1)pH, CONDUCTIVITY AND TEMPERATURE WERE RECORDED WHEN SAMPLED

SOURCE: SAMPLES TAKEN BY SPRI ANALYTICAL RESULTS FROM MOLYCORP.

NA - NOT AVAILABLE

TABLE 2
1994 MONITOR WELL WATER QUALITY DATA FOR TAILINGS AREA
 MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 2 of 3)

MONITOR WELL	TDS (mg/L)	SILVER (mg/L)	ALUMINUM (mg/L)	ARSENIC (mg/L)	BARIUM (mg/L)	BERYLLIUM (mg/L)	CALCIUM (mg/L)	CADMIUM (mg/L)	COBALT (mg/L)	CHROMIUM (mg/L)	COPPER (mg/L)	IRON (mg/L)	MERCURY (mg/L)
EW-1	1,200	<0.10	<0.05	<0.005	0.053	<0.004	240	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
EW-2	240	<0.10	<0.05	<0.005	0.068	<0.004	59.4	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
EW-2	290	<0.010	<0.05	<0.005	0.065	<0.004	57.8	0.0036	<0.010	<0.010	<0.010	<0.050	<0.0002
EW-3	830	<0.10	<0.05	<0.005	0.074	<0.004	179	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
EW-3	750	<0.010	<0.05	<0.005	0.054	<0.004	158	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
EW-4	440	<0.10	<0.05	<0.005	0.065	<0.004	101	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
EW-4	450	<0.010	<0.05	<0.005	0.068	<0.004	104	<0.0005	<0.010	<0.010	0.012	<0.050	<0.0002
MW-1	1,100	<0.10	<0.05	<0.005	0.025	<0.004	207	<0.0005	<0.010	<0.010	<0.010	0.068	<0.0002
MW-2	1,400	<0.10	<0.05	<0.005	0.022	<0.004	241	<0.0005	<0.010	<0.010	<0.010	4.6	<0.0002
MW-3	1,400	<0.10	<0.05	<0.005	0.032	<0.004	264	<0.0005	<0.010	<0.010	<0.010	0.07	<0.0002
MW-4	890	<0.10	<0.05	<0.005	0.084	<0.004	166	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-7A	1,300	<0.10	<0.05	<0.005	0.028	<0.004	273	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-7C	1,300	<0.10	<0.05	<0.005	0.028	<0.004	279	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-9A	1,200	<0.10	<0.05	<0.005	0.061	<0.004	247	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-10	150	<0.10	<0.05	<0.005	0.038	<0.004	28.2	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-11	200	<0.10	<0.05	<0.005	0.014	<0.004	28.6	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-11AB	220	<0.10	<0.05	<0.005	0.015	<0.004	28.5	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-12	260	<0.10	<0.05	<0.005	0.096	<0.004	47.1	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
MW-A	1,000	<0.10	<0.05	<0.005	0.03	<0.004	214	<0.0005	<0.010	<0.010	<0.010	0.066	<0.0002
MW-C	1,700	<0.10	<0.05	<0.005	0.04	<0.004	334	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002
CH	340	<0.10	<0.05	<0.005	0.059	<0.004	48.5	<0.0005	<0.010	<0.010	<0.010	<0.050	<0.0002

NOTES:

(1) pH, CONDUCTIVITY AND TEMPERATURE WERE RECORDED WHEN SAMPLED.

SOURCE: SAMPLES TAKEN BY SPRI. ANALYTICAL RESULTS FROM MOLYCORP.

NA - NOT AVAILABLE

TABLE 2
1994 MONITOR WELL WATER QUALITY DATA FOR TAILINGS AREA
 MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 3 of 3)

MONITOR WELL	POTASSIUM (mg/L)	MAGNESIUM (mg/L)	MANGANESE (mg/L)	MOLYBDENUM (mg/L)	SODIUM (mg/L)	NICKEL (mg/L)	LEAD (mg/L)	ANTIMONY (mg/L)	SELENIUM (mg/L)	SILICON (mg/L)	THALLIUM (mg/L)	VANADIUM (mg/L)	ZINC (mg/L)
EW-1	3.7	47.9	0.017	<0.02	41.7	<0.020	<0.002	<0.05	<0.005	13.8	<0.005	<0.010	<0.050
EW-2	3.3	10.4	0.169	<0.02	20.0	<0.020	<0.002	<0.05	<0.005	15.7	<0.005	<0.010	<0.050
EW-2	3.6	10	0.138	<0.02	19.6	<0.020	<0.002	<0.05	<0.005	17.3	<0.005	<0.010	0.091
EW-3	2.6	31.8	0.056	<0.02	28.6	<0.020	<0.002	<0.05	<0.005	12.4	<0.005	<0.010	0.364
EW-3	2.2	27.8	0.036	<0.02	28.9	<0.020	<0.002	<0.05	<0.005	11.9	<0.005	<0.010	<0.050
EW-4	1.5	17.8	<0.010	<0.02	15.5	<0.020	<0.002	<0.05	<0.005	12.4	<0.005	<0.010	0.364
EW-4	2.1	18.1	0.019	<0.02	16	<0.020	<0.002	<0.05	<0.005	12.7	<0.005	<0.010	<0.050
MW-1	3.0	41.2	0.035	0.04	55.4	<0.020	<0.002	<0.05	<0.005	11.9	<0.005	<0.010	<0.050
MW-2	3.1	52.2	0.37	1.7	95.6	<0.020	<0.002	<0.05	<0.005	1.8	<0.005	<0.010	<0.050
MW-3	1.5	48.6	0.032	<0.02	71.6	<0.020	<0.002	<0.05	<0.005	10.3	<0.005	<0.010	<0.050
MW-4	1.1	32.7	<0.010	0.21	64.2	<0.020	<0.002	<0.05	<0.005	10.3	<0.005	<0.010	<0.050
MW-7A	2.6	47.1	<0.010	<0.02	39.5	<0.020	<0.002	<0.05	<0.005	12.3	<0.005	<0.010	<0.050
MW-7C	3.9	48.4	<0.010	<0.02	45.1	<0.020	<0.002	<0.05	<0.005	12.1	<0.005	<0.010	<0.050
MW-9A	1.7	45.5	0.111	<0.02	66.0	<0.020	<0.002	<0.05	<0.005	10.5	<0.005	<0.010	<0.050
MW-10	1.3	4.4	<0.010	<0.02	14.7	<0.020	<0.002	<0.05	<0.005	10.8	<0.005	<0.010	<0.050
MW-11	2.8	8.6	<0.010	0.06	25.8	<0.020	<0.002	<0.05	<0.005	15.5	<0.005	<0.010	<0.050
MW-11AB	2.6	8.6	<0.010	0.06	25.7	<0.020	<0.002	<0.05	<0.005	15.5	<0.005	0.01	<0.050
MW-12	2.9	8.5	<0.010	0.02	24.5	<0.020	<0.002	<0.05	<0.005	13.6	<0.005	<0.010	<0.050
MW-A	2.8	35.7	0.04	0.63	50.6	<0.020	<0.002	<0.05	<0.005	10.9	<0.005	<0.010	<0.050
MW-C	2.1	56.1	0.774	1.12	82.2	<0.020	<0.002	<0.05	<0.005	11.6	<0.005	<0.010	<0.050
CH	1.2	9.4	<0.010	<0.02	57.8	<0.020	<0.002	<0.05	<0.005	9.8	<0.005	<0.010	0.946

NOTES:

(1)pH, CONDUCTIVITY AND TEMPERATURE WERE RECORDED WHEN SAMPLED.

SOURCE: SAMPLES TAKEN BY SPRI. ANALYTICAL RESULTS FROM MOLYCORP.

NA - NOT AVAILABLE

TABLE 3
WATER QUALITY DATA FOR THE RED RIVER - (SPRI, MAY 1994)
MINE AREA - MOLYCORP, INC. - QUESTA, NEW MEXICO
(Page 1 of 4)

Sample ID	Sample Description	pH Meter	pH Strip	Temp (°F)	Conductivity (µmhos)	Total Alkalinity (mg/L)	TDS (mg/L)	TSS (mg/L)	Aluminum Susp. (mg/L)	Aluminum Dis. (mg/L)	Fluoride (mg/L)	Iron (mg/L)
BC-1	BC 75' N of High St. bridge	6.40	5.0	44.9	49.8	20	82	26	0.75	0.60	0.15	2.70
BC-2	BC 500' S of Spring flow from BCS-1	6.55	5.5	43.6	66.2	18	78	10	<.5	0.60	0.12	1.00
BCS-1	Spring, 1.2 mi. N High St.	4.42	5.0	44.7	478.0	0	530	<1	<.5	5.20	0.30	<.01
BOS-1	Spring, W side of Bobita Campground	-	6.0	61.0	605.0	44	737	8	<.5	<.5	0.32	0.16
CCS-1	Middle sump Capulin Canyon	-	3.0	50.9	13,440	0	24,950	8	1.00	1,310	53.30	258.30
CCS-2	Spring drainage W side Capulin Canyon	-	7.0	56.9	260.0	54	416	107	2.80	2.2	0.62	11.72
CCS-3	Adit W side Capulin Canyon	-	4.0	45.1	2,960	0	2,686	295	1.60	53.6	12.00	25.20
CCS-4	Seep, Capulin Canyon S of adit	-	4.0	48.2	1,775	0	1,193	12.7	<.5	23.2	5.70	2.35
CCS-5	Culvert drain W side of Capulin Canyon	-	4.0	66.7	1,700	0	1,896	3.7	<.5	74.8	9.80	0.21
CCS-6	Seep, 200' E Capulin Canyon	-	3.0	73.7	2,430	0	2,673	6.4	<.5	116.2	13.00	7.68
CLB-1	Columbine Creek-200' up from confluence	-	6.5	57.7	134.0	49	70	3	<.5	<.5	0.18	0.34
ECCS-1	Seep near river, E of Capulin Canyon	-	6.5	60.5	580.0	26	413	8	<.5	<.5	1.50	0.32
ECCS-2	Seep S of Hwy 38, E of Capulin Canyon	-	4.0	62.0	1,752	0	913	1	<.5	73	5.20	0.79
EGHS-1	Seep S of Hwy 38, E of Goathill	-	7.0	55.6	810.0	47	843	1.2	<.5	<.5	0.47	0.15
GHS-1	Seepage Goat Hill Dump	-	2.0	69.1	11,140	0	23,890	39	0.97	1,183	36.70	257.00
GHS-2	Seep from bore hole +GHS1	-	2.0	73.0	11,350	0	17,623	29	1.70	1,125	43.30	252.00
GHS-3	Natural seep from volcanic rock	-	-	-	-	0	11,980	94	1.30	645	26.00	250.00
HCS-1	seeps, Upper Hanson Creek Canyon	-	2.5	44.2	5,520	0	6,493	13.6	<.5	185.4	15.00	177.90
HCS-2	seep, downgradient from HCS-1	-	2.5	50.6	5,390	0	6,230	7.6	<.5	154	15.60	164.80
HCS-3	Seep S of Hwy 38, W of Hanson Creek	-	4.0	77.0	1,232	0	1,773	<1	<.5	2.6	1.40	0.43
HTS-1	Upper Hot-N-Tot Canyon	2.86	2.3	48.2	2,670	0	2,610	43	<.5	97.8	2.30	212.80
MC-1	Mallette Creek-alpine Lodge	6.86	6.0	52.2	80.4	22	96	16	0.65	0.60	0.25	1.20
PC-1	Pioneer Creek, Arrowhead Lodge	7.34	7.0	45.1	107.0	43	94	15	<.5	0.50	0.10	0.70
POS-1	seep, Portal Springs W of mine portal	-	4.5	54.4	1,900	10	1,800	34	<.5	21.3	153.00	8.24
RR-1	RR W of confluence w/BitCrk	7.40	6.0	43.8	99.3	43	82	4	<.5	0.50	0.86	1.10
RR-2	RR 50' E of BC Confluence	7.58	6.5	45.9	108.0	70	88	18	<.5	0.50	0.08	0.80
RR-3	RR behind Alpine Lodge	7.53	6.0	48.2	93.7	51	92	22	0.5	0.50	0.10	2.10
RR-4	RR, Goose Lake Rd/East RR	7.73	7.0	43.5	130.0	47	98	13	<.5	<.5	0.10	0.70
RR-5	RR, Hot-N-Tot Creek/upstream	7.45	7.0	47.0	144.0	59	100	32	0.75	0.50	0.11	2.20

TABLE 3
WATER QUALITY DATA FOR THE RED RIVER - (SPRI, MAY 1994)
 MINE AREA - MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 2 of 4)

Sample ID	Sample Description	pH Meter	pH Strip	Temp (°F)	Conductivity (µmhos)	Total Alkalinity (mg/L)	TDS (mg/L)	TSS (mg/L)	Aluminum Susp. (mg/L)	Aluminum Dis. (mg/L)	Fluoride (mg/L)	Iron (mg/L)
RR-6	RR, Hot-N-Tot Creek/dwnstream	7.52	6.5	48.0	145 0	43	92	34	0.60	< 5	0.11	1.90
RR-7	RR down from Sulphur Gulch	7.48	7.0	62.0	122 0	48	108	49	0.75	< 5	0.16	2.10
RR-8	RR upstream from mill gate	7.53	6.5	57.0	129 0	56	106	57	0.50	0.60	0.12	2.14
RR-9	RR 200' up from Hanson Creek confluence	7.46	7.0	54.5	144 0	53	104	31.2	<.5	< 5	0.13	1.70
RR-10	RR, downstream of Portal Springs	7.46	7.0	54.5	196 0	48	112	31.2	1.60	< 5	0.20	2.41
RR-11	RR, down from Hanson Creek confluence	7.51	6.5	51.5	177 0	61	104	17.6	<.5	< 5	0.11	1.29
RR-12	RR 100' E of Columbine Creek Confluence	-	6.5	55.5	196 0	48	213	58	0.54	0.6	0.30	2.35
RR-13	RR, highway bridge W of Columbine Creek	-	6.5	55.5	196 0	50	163	54	0.54	< 5	0.20	1.80
RR-14	RR up from Goathill Gulch	-	6.5	58.1	241 0	42	123	52	0.72	< 5	0.32	2.05
RR-15	RR down from Goathill Gulch	-	7.0	57.0	224 0	52	130	62	0.83	< 5	0.32	2.24
RR-16	RR Questa Ranger Sta ion	-	6.5	54.0	171 0	41	150	106	0.83	< 5	0.35	2.72
SGS-1	Sulphur Gulch-spring pond	6.65	7.0	75.5	753 0	83	620	6.5	<.5	< 5	1.30	0.75
SSC-1	seep, S of west end Sugar Shack South	-	5.0	55.0	2,350	33	2,017	214	2.20	5.3	92 00	<.01

NOTES:

Sampling by SPRI; analytical results from MolyCorp, Inc.

(1)-pH Strip, temperature and conductivity were measured field measurements.

All samples are total metals except alum. Suspended and Slum. Dissolved

<symbols are detection limits.

TABLE 3
WATER QUALITY DATA FOR THE RED RIVER - (SPRI, MAY 1994)
 MINE AREA - MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 3 of 4)

Sample ID	Ferrous Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Zinc (mg/L)	Copper (mg/L)	Molybdenum (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Silica (mg/L)	Chlorine (mg/L)	Cadmium (mg/L)	Sulfate (mg/L)
BC-1	-	0.003	0.041	0.025	0.03	< 02	2.5	<1.0	6	1.6	20	2.5	<.005	12
BC-2	-	0.002	0.034	0.025	0.02	< 02	2.7	<1.0	12.5	3.5	22	3	<.005	13.7
BCS-1	-	<.002	1.360	0.491	0.18	< 02	9.4	1 5	48.9	27 2	46	5	0.005	171
BOS-1	-	<.002	< 01	0.060	0.01	< 02	13.1	1 2	85.2	21 5	20	20	<.005	217
CCS-1	7.0	<.002	416.20	146.00	15.3	< 02	23.7	<1.0	504	1,032	92.4	30	0.75	11,996
CCS-2	-	0.036	0.213	0.149	0.024	< 02	9.5	2.6	20.2	4.2	46.6	7.5	<.005	56.8
CCS-3	<1.0	0.078	12.600	6.960	0.162	< 02	70.3	9.6	348	84	76	14.5	0.021	1,736
CCS-4	-	<.002	10 300	2.620	0.21	< 02	30.9	2	145	38 5	52	9.5	0.007	541.7
CCS-5	-	0.004	28 900	7.600	1.21	< 02	19.1	1.7	118	76 9	112	9.5	0.036	1,152
CCS-6	-	0.003	13.600	4.470	0.998	< 02	30	3 5	233	65	62	35	0.017	1,649
CLB-1	-	<.002	< 01	0.022	0.008	< 02	1.5	<1.0	17	1.8	14	2.5	<.005	1.7
ECCS-1	-	<.002	< 01	0.115	0.01	< 02	9.8	1 2	52.8	12.7	28	18.5	<.005	128.3
ECCS-2	-	0.003	8.740	2.820	0.921	< 02	55.7	3 5	138	41	28	95	0.015	669
EGHS-1	-	<.002	< 01	0.042	0.009	< 02	9.5	1.7	104.4	23.1	18	10.5	<.005	190
GHS-1	8.0	<.010	239.50	82.70	8.6	< 02	11.7	<1.0	444	760	104	37	0.381	13,312
GHS-2	10.0	<.010	263.80	86.40	8 5	< 02	18.4	<1.0	432	704	96.7	40	0.409	11,667
GHS-3	1.0	0.017	22.00	4.22	1.58	< 02	32.6	<1.0	504	405	102	15	<.005	7,763
HCS-1	2.0	0.004	20 300	3.740	0.512	< 02	17.8	<1.0	504	274	63.5	10	0.012	3,876
HCS-2	-	<.002	17.100	3.880	0.629	< 02	17.2	<1.0	454	199	75.9	16	0.013	3,436
HCS-3	-	0.004	0.445	0.183	0.025	< 02	48	2.6	156	18	22	90	<.005	377
HTS-1	7.0	0.009	6.250	2.960	1.14	< 02	2.1	<1.0	55.9	43 5	100	16	0.012	848
MC-1	-	<.002	0.054	0.043	0.02	< 02	3.9	1.4	8.2	3.1	32	4.5	<.005	16.4
PC-1	-	<.002	0.036	0.014	0.02	< 02	2	<1.0	19.8	2.4	15	5	<.005	20
POS-1	-	<.002	6.830	2.490	0.05	< 02	26.2	3.4	206	16.6	32	27	0.01	622
RR-1	-	<.002	0.033	0.048	0.02	< 02	2.2	<1.0	15	2.5	14	4	<.005	8
RR-2	-	<.002	0.039	0.012	0.01	< 02	2	<1.0	17.7	2.4	14	2.5	<.005	3
RR-3	-	0.004	0.086	0.018	0.02	0 003	2.3	<1.0	15.7	2.5	17	4	<.005	13.8
RR-4	-	<.002	0.030	0.006	0.01	< 02	1.9	<1.0	17	2.2	12	5	<.005	2.2
RR-5	-	0.003	0.065	0.022	0.02	< 02	2.3	<1.0	17	2.5	14	5	<.005	17.4

TABLE 3
WATER QUALITY DATA FOR THE RED RIVER - (SPRI, MAY 1994)
 MINE AREA - MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 4 of 4)

Sample ID	Ferrous Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)	Zinc (mg/L)	Copper (mg/L)	Molybdenum (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Silica (mg/L)	Chlorine (mg/L)	Cadmium (mg/L)	Sulfate (mg/L)
RR-6	-	0.003	0.080	0.034	0.02	<.02	2.3	<1.0	16.6	2.4	14	5	<.005	17.7
RR-7	-	0.004	0.080	0.030	0.02	<.02	2.8	<1.0	20	3.1	16	5	<.005	15.9
RR-8	-	0.004	0.082	0.027	0.02	<.02	2.8	<1.0	19.1	3	24	4 5	<.005	19.5
RR-9	-	0.003	0.064	0.202	0.01	<.02	2.6	<1.0	18.6	3.4	14	5	<.005	14.5
RR-10	-	0.004	0.109	0.018	0.02	<.02	2.9	<1.0	20.4	3.9	17	5	<.005	17.4
RR-11	-	0.004	0.048	<.005	0.02	<.02	2.6	<1.0	18.5	3.3	20	4	<.005	11.4
RR-12	-	0.004	0.126	0.042	0 018	<.02	3	<1.0	21.4	4.6	64	2 5	<.005	33.6
RR-13	-	0.004	0.078	0.031	0 016	<.02	2.9	<1.0	21	4.4	18	3	<.005	23.5
RR-14	-	0.006	0.242	0.067	0.02	<.02	3	1	23	5	18	3	0.007	29.7
RR-15	-	0.004	0.213	0.062	0 018	<.02	3	<1.0	22.8	4.9	20	3 5	<.005	34.7
RR-16	-	0.014	0.290	0.073	0 024	<.02	2.7	<1.0	22.1	4.5	14	6 5	<.005	28.9
SGS-1	-	<.002	0.252	0.099	0.01	0.19	17.6	4	119	17.7	24	22.5	<.005	160
SSC-1	-	0.026	12.300	2.920	0 213	0.88	58.7	5 3	298	13.5	30	72.5	0 02	679.8

TABLE 4
MINE SITE MONITOR WELL GROUND WATER ELEVATIONS
 (FROM MOLYCORP)

MOLYCORP, NC. - QUESTA DIVISION

MMW WATER ELEVATIONS

WELL	REFERENCE ELEVATION	H2O ELEV 2/22/96	H2O ELEV 3/13/98	H2O ELEV 4/18/96	H2O ELEV 5/23/96	H2O ELEV 6/21/96	H2O ELEV 7/25/96	H2O ELEV 8/21/96	H2O ELEV 9/20/96	H2O ELEV 1/27/97	H2O ELEV 2/17/97	H2O ELEV 3/7/97	H2O ELEV 3/31/97	H2O ELEV 4/25/97	H2O ELEV 5/21/97	H2O ELEV 6/25/97	H2O ELEV 7/22/97	H2O ELEV 8/20/97
MMW-2	7700.05	7665.59	7665.60	7665.47	7665.10	7665.52	7665.10	7665.52	7665.73	665.41	7665.49	-	7665.95	7665.88	7665.92	7665.26	7665.04	7665.28
MMW-3	7701.07	7669.10	7669.14	7669.10	7668.69	7669.08	7668.69	7669.08	7669.17	7668.79	7668.89	-	7669.44	7669.24	7669.36	7668.78	7668.50	7668.72
MMW-7	8090.16	8028.41	8028.58	8028.80	8028.26	8029.00	8029.00	8028.26	8028.69	8028.71	8028.59	-	8028.46	8028.59	8028.74	8028.58	8028.46	8028.66
MMW-8A	7858.22	7761.69	7761.8	7761.77	7762.06	7762.60	7762.06	7762.60	7762.77	7762.07	7761.80	-	7761.99	7761.41	7762.56	7762.62	7762.05	7761.91
MMW-8B	7859.47	7763.73	7763.84	7763.87	7764.14	7764.51	7764.14	7764.51	7764.63	7763.76	7763.57	-	7763.75	7764.14	7764.53	7764.72	7763.52	7763.88
MMW-10A	7939.33	7917.58	7917.37	7917.36	7918.19	7917.55	7918.19	7917.55	7916.64	7911.40	7909.49	7907.48	7907.17	7906.45	7907.87	7915.41	7916.10	7914.09
MMW-10B	7939.20	7917.52	7917.32	7917.31	7918.05	7917.53	7918.05	7917.53	7916.57	7911.25	7909.32	7907.24	7906.90	7905.85	7905.60	7915.20	7916.00	7913.90
MMW-10C	7939.44	7917.18	7916.99	7916.99	7917.75	7917.23	7917.75	7917.23	7916.31	7911.29	7909.48	7907.47	7907.10	7906.29	7907.72	7914.94	7915.99	7914.00
MMW-11	8004.93	7917.50	7915.3	7915.28	7916.11	7915.57	7916.11	7915.57	7914.64	7909.74	7908.07	7906.09	7905.61	7904.77	7906.05	7913.82	7914.43	7912.50
MMW-13	8072.45	7963.75	7963.32	7963.25	7965.05	7965.19	7965.05	7965.19	7961.17	7947.13	7945.30	7942.75	7941.86	7941.35	7942.41	7954.32	7956.64	7953.50
MMW-14	8166.50	0	0	-	-	-	0	0	0	8106.14	8106.28	8106.28	8106.28	8106.25	8106.27	8106.27	8106.28	8106.27
MMW-16	8139.66	8057.03	8056.86	8056.66	8057.32	8056.05	8057.32	8056.05	8053.86	8053.33	8053.24	DRY	DRY	MUD	MUD	MUD	MUD	MUD
P-1	7827.08	-	-	-	-	-	-	-	-	-	7805.43	-	7804.46	7805.08	-	7804.08	7806.80	7807.56
P-2	7822.34	-	-	-	-	-	-	-	-	-	7806.24	-	7805.56	7805.88	-	7804.99	7807.34	7807.95
P-3	7842.71	-	-	-	-	-	-	-	-	-	7811.46	-	7810.86	7811.44	-	7816.15	7813.77	7813.78
P-4A	7834.36	-	-	-	-	-	-	-	-	-	7810.72	-	7810.23	7810.41	-	7814.36	7812.21	7812.45
P-4B	7834	-	-	-	-	-	-	-	-	-	7809.89	-	7809.27	7809.74	-	7813.89	7811.58	7811.85
P-5A	7840.37	-	-	-	-	-	-	-	-	-	7872.07	-	7818.86	7819.68	-	7823.82	7822.07	7821.43
P-5B	7840.18	-	-	-	-	-	-	-	-	-	7817.68	-	7817.65	7818.28	-	7821.83	7820.08	7819.69
P-5C	7840.29	-	-	-	-	-	-	-	-	-	7816.19	-	7816.26	7816.79	-	7819.66	7818.17	7817.89

TABLE 5
1994 MONITOR WELL WATER QUALITY DATA FOR MINE AREA
 MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 1 of 3)

MONITOR WELL	SAMPLE DATE 1994	WELL TD (feet)	Corrected DEPTH TO WATER (feet)	DEPTH TO PUMP NTAKE (feet)	pH(1)	CONDUCTIVITY (1) (µmhos)	TEMP (1) (°C)	CARBO-NATE (mg/L)	BICARBO-NATE (mg/L)	HYDR-OXIDE (mg/L)	TOTAL ALK (mg/L)	CHLORIDE (mg/L)	FLUORIDE (mg/L)	SULFATE (mg/L)
MMW-2	8-Nov	68	31.69	50	4.90	3,680	7.9	<1	<1	<1	<1	6.8	24.0	2,100
MMW-3	7-Nov	140	27.76	80	7.50	3,970	10.9	<1	222	<1	222	5.8	2 59	1,700
MMW-7	7-Nov	161	61.11	120	4.40	9,490	17.2	<1	<1	<1	<1	21	1.12	10,400
DUP-11A(2)	7-Nov	NA	NA	NA	NA	NA	NA	<1	<1	<1	<1	21	0 98	10,500
MMW-8A	8-Nov	178	96.77	140	7.00	2,860	8.4	<1	165	<1	165	8.7	2.72	1,300
MMW-8B	8-Nov	129	96.03	112	6.40	1,780	7.1	<1	19	<1	19	5.6	1 83	730
MMW-10A	8-Nov	144	21.70	100	5.80	2,400	7.8	<1	<1	<1	<1	27	11.2	1,100
DUP-12B (3)	8-Nov	NA	NA	NA	NA	NA	NA	<1	<1	<1	<1	26	7 96	1,100
MMW-10A (4)	19-Nov	NA	NA	NA	NA	NA	NA	<1	<1	<1	<1	26	8 28	1,200
MMW-10B	7-Nov	189	21.57	140	7.90	2,250	10.1	10	<1	66	76	28	12.2	1,100
MMW-10C	8-Nov	50	21.80	40	4.70	2,000	11.8	<1	<1	<1	<1	20	15.4	880
MMW-11	7-Nov	184	86.71	150	5.60	2,450	15.7	<1	<1	<1	<1	22	17.6	1,300
MMW-13	8-Nov	145	105.98	130	7.90	2,280	8.9	<1	200	<1	200	14	1 67	770

NOTES:

(1) pH, CONDUCTIVITY AND TEMPERATURE WERE RECORDED WHEN SAMPLED.

(2) - Dup 11A = DUPLICATE SAMPLE FOR MMW-7

(3) - Dup 12B = DUPLICATE SAMPLE FOR MMW-10A

(4) - SAMPLED AFTER AQUIFER TEST

NA - Not Available

SOURCE: SAMPLES TAKEN BY SPRI, ANALYTICAL RESULTS FROM MOLYCORP.

TABLE 5
1994 MONITOR WELL WATER QUALITY DATA FOR MINE AREA
MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 2 of 3)

MONITOR WELL	TDS (mg/L)	SILVER (mg/L)	ALUMINUM (mg/L)	ARSENIC (mg/L)	BARIUM (mg/L)	BERYLLIUM (mg/L)	CALCIUM (mg/L)	CADMIUM (mg/L)	COBALT (mg/L)	CHROMIUM (mg/L)	COPPER (mg/L)	IRON (mg/L)	MERCURY (mg/L)
MMW-2	3,400	<0.10	63.5	<0.005	<0.010	0.015	501	0.024	0.280	<0.010	0.088	50.8	<0 0002
MMW-3	2,900	<0.10	0.75	<0.005	0.047	<0.004	567	0.0024	0.089	<0.010	<0.010	0.076	<0 0002
MMW-7	16,000	<0.50	943	<0.0 5	0.108	0.104	544	0.096	4.91	0.193	4.84	384	<0 0002
DUP-11A (2)	16,000	<0.50	961	<0.0 5	0.074	0.122	534	0.092	4.99	0.17	5.04	375	<0 0002
MMW-8A	2,200	<0.10	<0.05	<0.005	0.103	<0.004	466	0.002	<0.010	<0.010	<0.010	2.84	<0 0002
MMW-8B	1,100	<0.10	0.44	<0.005	0.016	<0.004	206	<0.0005	<0.010	<0.010	<0.010	<0.050	<0 0002
MMW-10A	1,700	<0.10	33.4	<0.005	<0.010	0.008	275	0.028	0.148	<0.010	0.558	<0.050	<0 0002
DUP-12B (3)	1,700	<0.10	34.2	<0.005	<0.010	0.008	270	0.024	0.137	<0.010	0.58	<0.050	<0 0002
MMW-10A (4)	1,700	<0.010	31.6	<0.005	<0.010	0.006	245	0.0224	0.141	<0.010	0.534	0.086	<0 0002
MMW-10B	1,800	<0.10	8.74	<0.005	0.034	0.007	347	0.025	0.074	<0.010	0.179	0.101	<0 0002
MMW-10C	1,400	<0.10	31.1	<0.005	0.014	0.007	204	0.0026	0.106	<0.010	0.38	<0.050	<0 0002
MMW-11	2,000	<0.10	56.3	<0.005	0.016	0.013	276	0.036	0.266	0.036	0.919	0.129	<0 0002
MMW-13	1,400	<0.10	<0.05	<0.005	0.036	<0.004	316	<0.0005	0.013	<0.010	<0.010	0.198	<0 0002

NOTES:

(1) pH, CONDUCTIVITY AND TEMPERATURE WERE RECORDED WHEN SAMPLED.

(2) - Dup 11A = DUPLICATE SAMPLE FOR MMW-7

(3) - Dup 12B = DUPLICATE SAMPLE FOR MMW-10A

(4) - SAMPLED AFTER PUMP TEST

SOURCE: SAMPLES TAKEN BY SPRI, ANALYTICAL RESULTS FROM MOLYCORP.

TABLE 5
1994 MONITOR WELL WATER QUALITY DATA FOR MINE AREA
 MOLYCORP, INC. - QUESTA, NEW MEXICO
 (Page 3 of 3)

MONITOR WELL	POTASSIUM (mg/L)	MAGNESIUM (mg/L)	MANGANESE (mg/L)	MOLYBDENUM (mg/L)	SODIUM (mg/L)	NICKEL (mg/L)	LEAD (mg/L)	ANTIMONY (mg/L)	SELENIUM (mg/L)	SILICON (mg/L)	THALLIUM (mg/L)	VANADIUM (mg/L)	ZINC (mg/L)
MMW-2	10.8	137	52.1	<0.02	64.6	0.61	<0.002	<0.05	<0.05	20.3	<0.005	<0 010	9.48
MMW-3	7.5	96.2	34.5	<0.02	103	0.236	<0.002	<0.05	<0.005	7.6	<0.005	<0 010	1.36
MMW-7	12.0	1250	72.1	<0.10	175	10.5	0.10	<0.25	<0.025	22.7	<0.005	0.104	11.7
DUP-11A (2)	12.1	1230	73.3	<0.10	178	10.7	0.06	<0.25	<0.025	22.6	<0.005	0.106	11.9
MMW-8A	3.8	85.6	7.15	<0.02	41.5	<0.020	<0.002	<0.05	<0.005	11.1	<0.005	<0 010	<0.050
MMW-8B	2.9	55.5	0.202	<0.02	33.9	0.059	<0.002	<0.05	<0.005	17.3	<0.005	<0 010	0.211
MMW-10A	2.8	77.9	13.8	<0.02	26.5	0.325	<0.002	<0.05	<0.005	14.3	<0.005	<0 010	2.29
DUP-12B (3)	2.5	76.7	12.8	<0.02	26.4	0.293	<0.002	<0.05	<0.005	14.0	<0.005	<0 010	2.07
MMW-10A (4)	3.7	69.7	13.1	<0.02	25.6	0.279	0.004	<0.05	<0.005	14.1	<0.005	<0 010	2.68
MMW-10B	3.5	80.3	8.5	<0.02	25.8	0.201	0.021	<0.05	<0.05	12.8	<0.005	<0 010	1.5
MMW-10C	2.8	75.2	16.3	<0.02	20.2	0.0347	<0.002	<0.05	<0.005	9.9	<0.005	<0 010	3.2
MMW-11	3.4	133	31.7	<0.02	25.5	0.593	0.086	<0.05	<0.005	14.2	<0.005	<0 010	5.0
MMW-13	5.4	38.7	1.02	0.05	30	<0.020	<0.002	<0.05	<0.005	8.8	<0.005	<0 010	0.222

NOTES:

(1) pH, CONDUCTIVITY AND TEMPERATURE WERE RECORDED WHEN SAMPLED.

(2) - Dup 11A = DUPLICATE SAMPLE FROM MMW-7

(3) - Dup 12B = DUPLICATE SAMPLE FOR MMW-10A

(4) - SAMPLED AFTER PUMP TEST

SOURCE: SAMPLES TAKEN BY SPRI, ANALYTICAL RESULTS FROM MOLYCORP

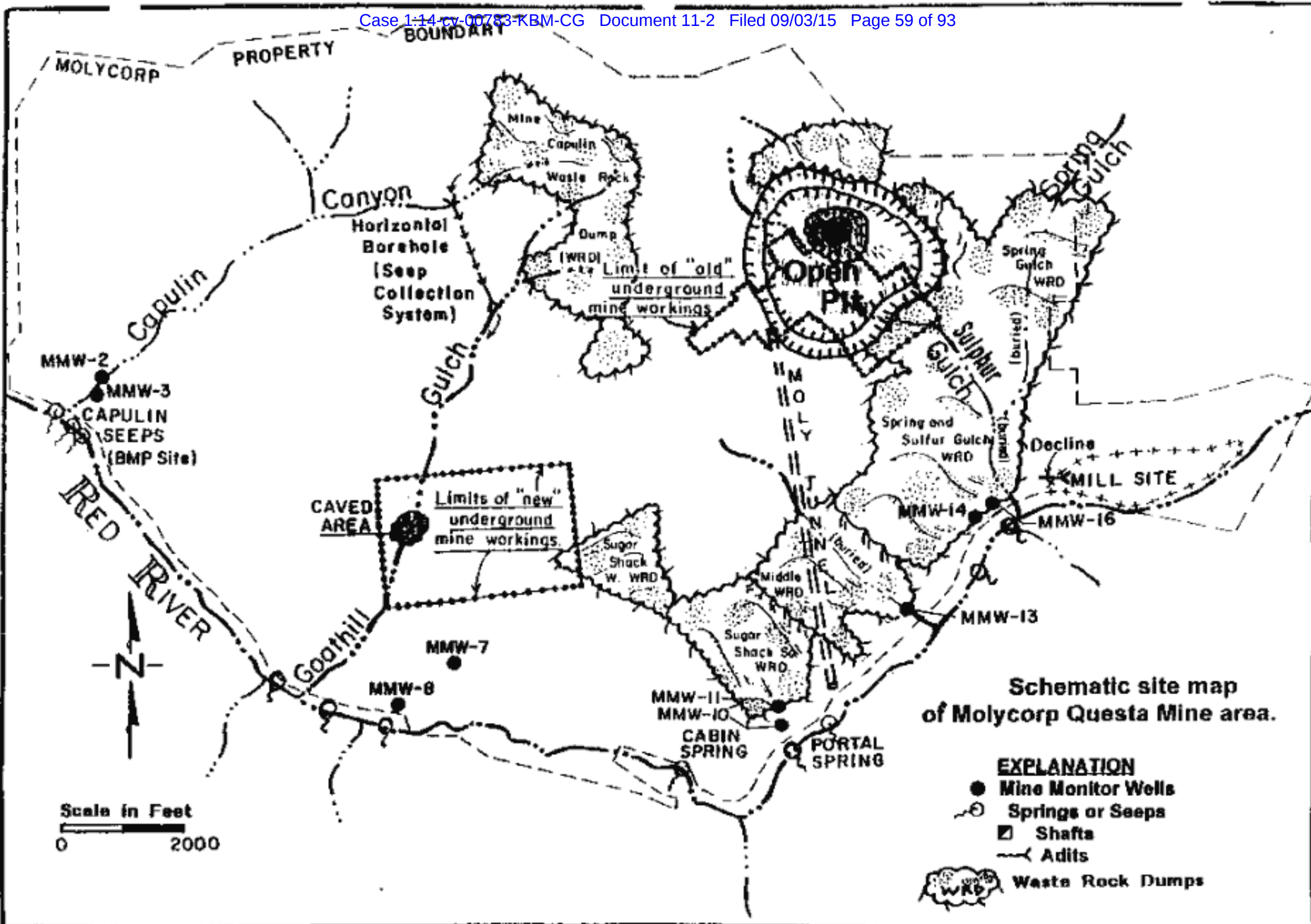
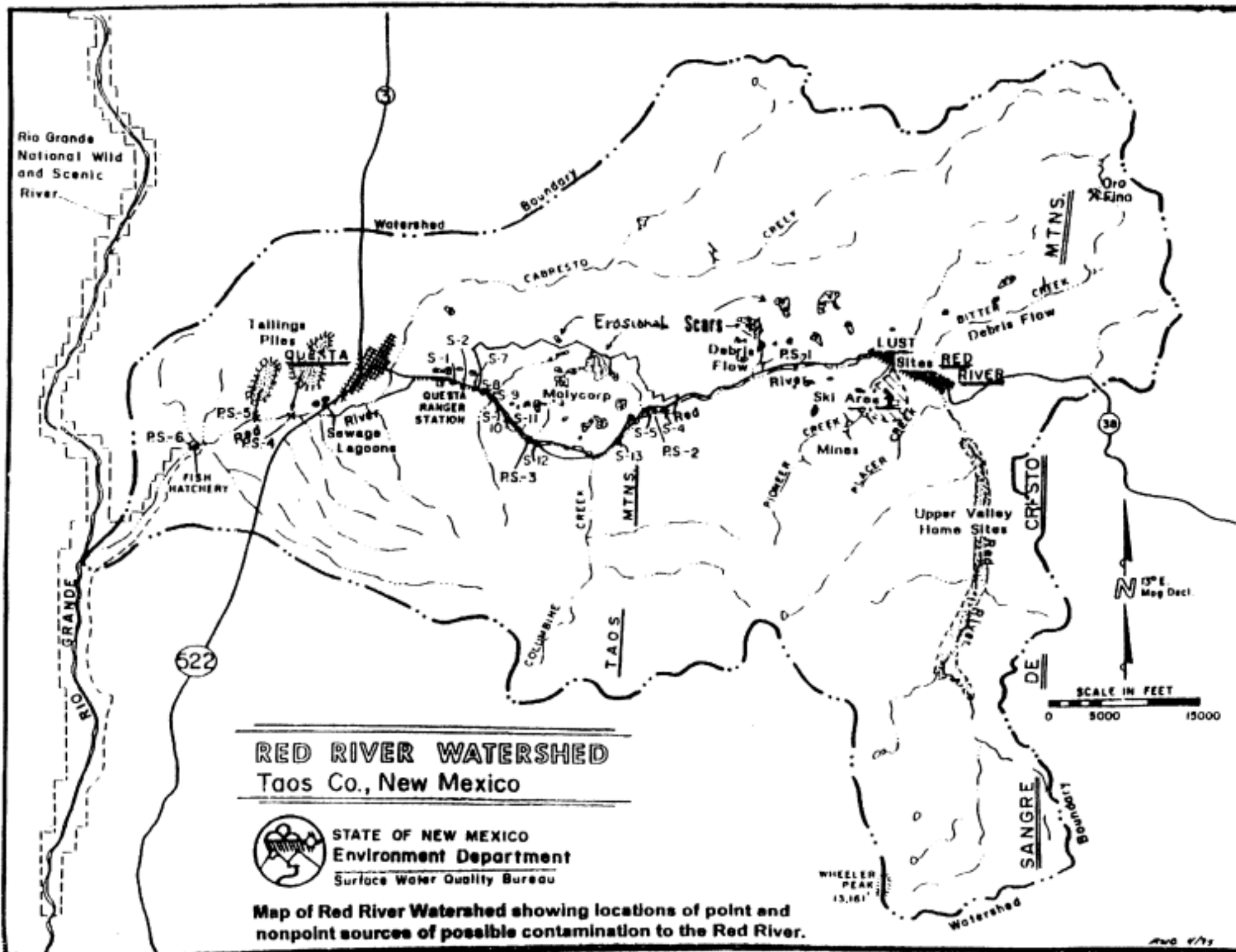


FIGURE 1

(MODIFIED FROM NMED, March 1996)

(MODIFIED FROM NMED, March 1996)



EXPLANATION

POINT SOURCE POLLUTION:

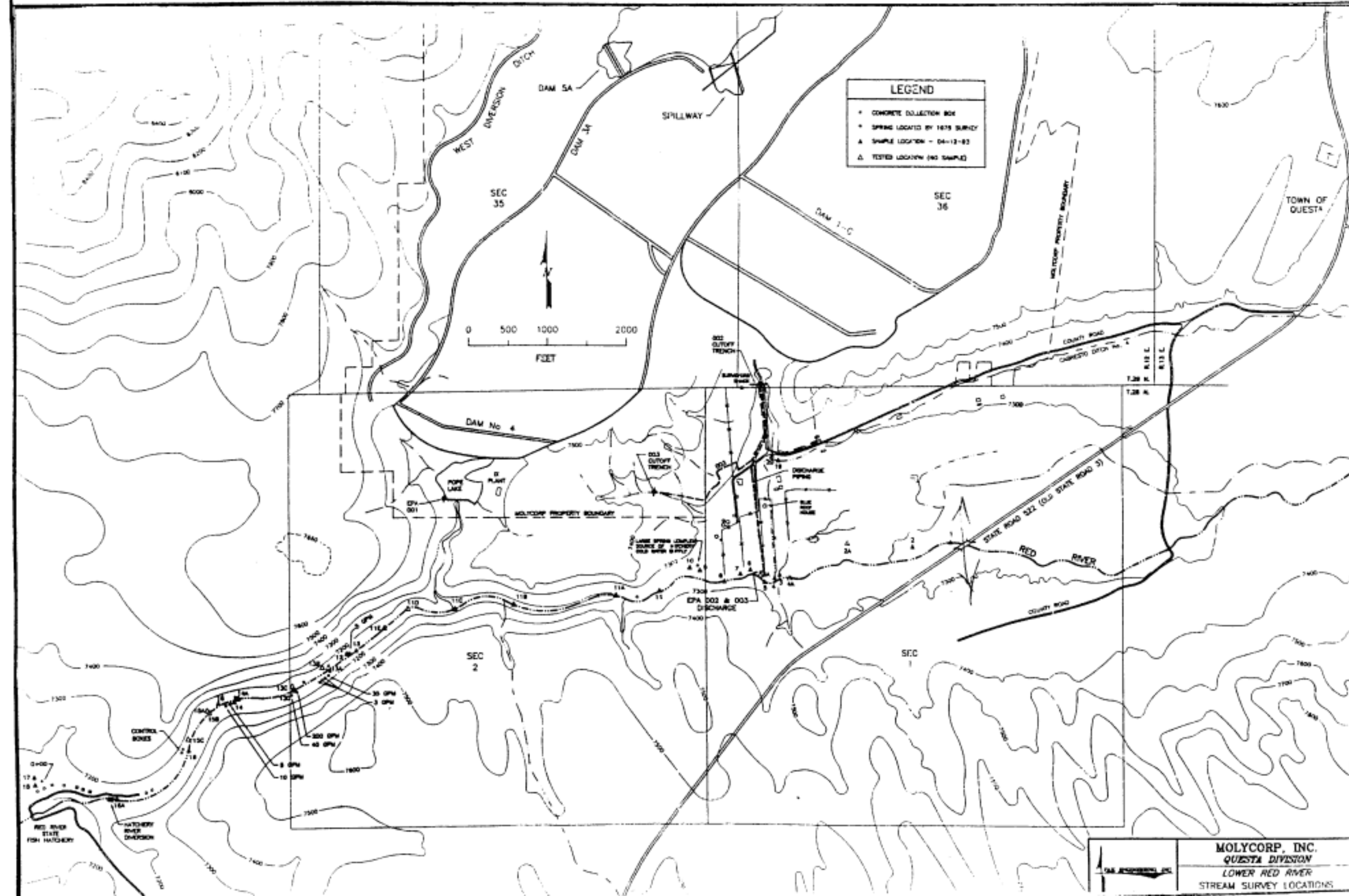
- PS-1: Town of Red River Wastewater Treatment Plant
- PS-2: Molycorp Mill Site Outfall #005
- PS-3: Molycorp Mine, Goathill Gulch Outfall #004
- PS-4: Molycorp East Tailings Pile Outfall #002
- PS-5: Molycorp Pope Lake/W. Tailings Outfall #001
- PS-6: Red River Fish Hatchery (NMDG&F)

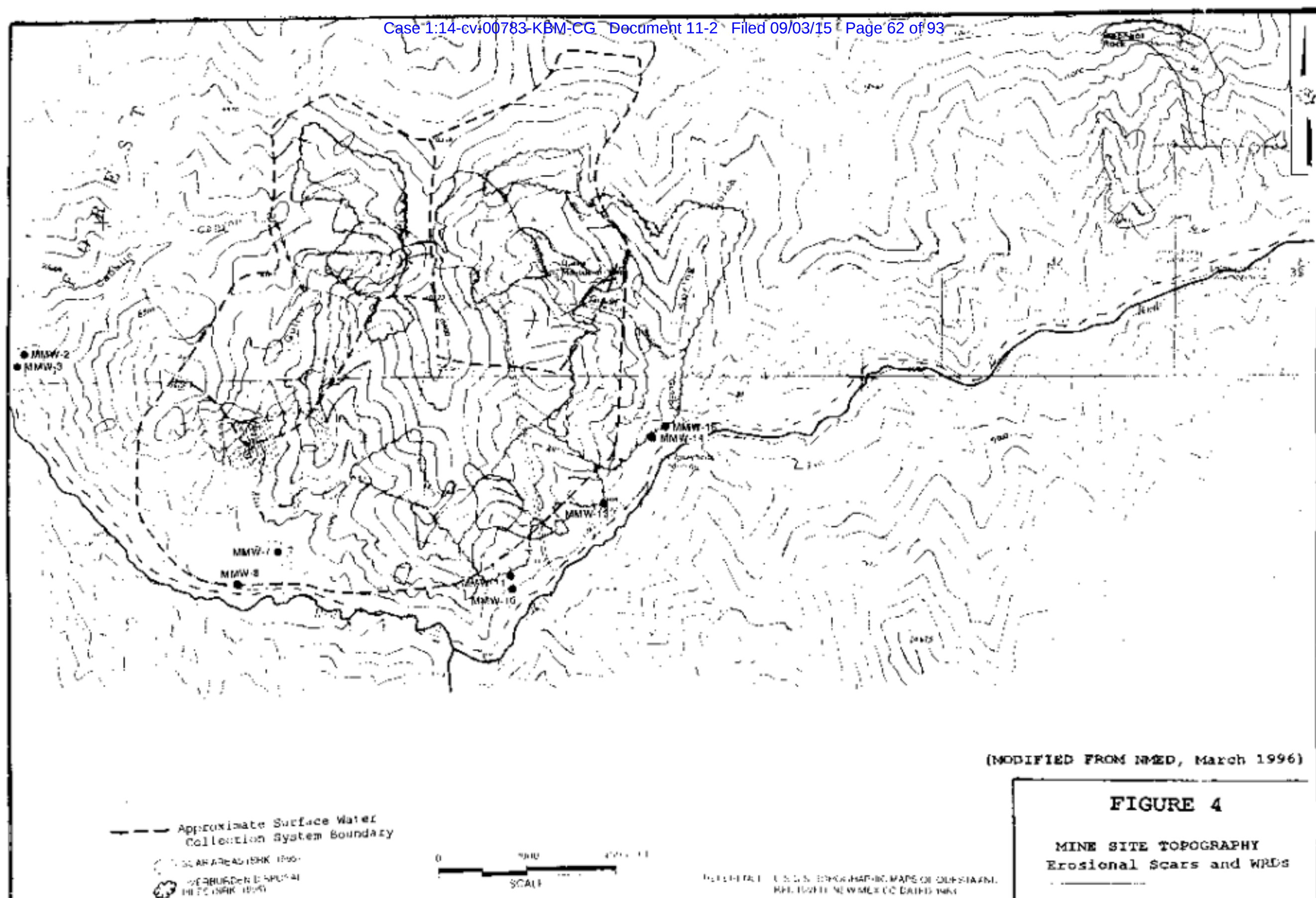
NONPOINT SOURCE POLLUTION:

- S-1 to S-13: Red River Groundwater Seeps (ARD)
- Hydrothermally Altered Volcanic Rock Scars
- Molycorp Mine
- Scattered Abandoned Mine and Mill Sites (Esp. Pioneer and Bitter Creeks)
- Upper RR Valley Home Sites: septic tanks, leach fields
- Town of Red River: Leaking Underground Storage Tanks (LUST)
- Red River Ski Area
- Town of Questa Sewage Lagoons
- Landslide/Debris Flow Gravels and Sediment (Bitter, Hansen and Hotentot Creeks)

Topography and Sample Locations

(TAKEN FROM VAIL, October 1994)





MOLYCORP MINE SITE

Questa, NM

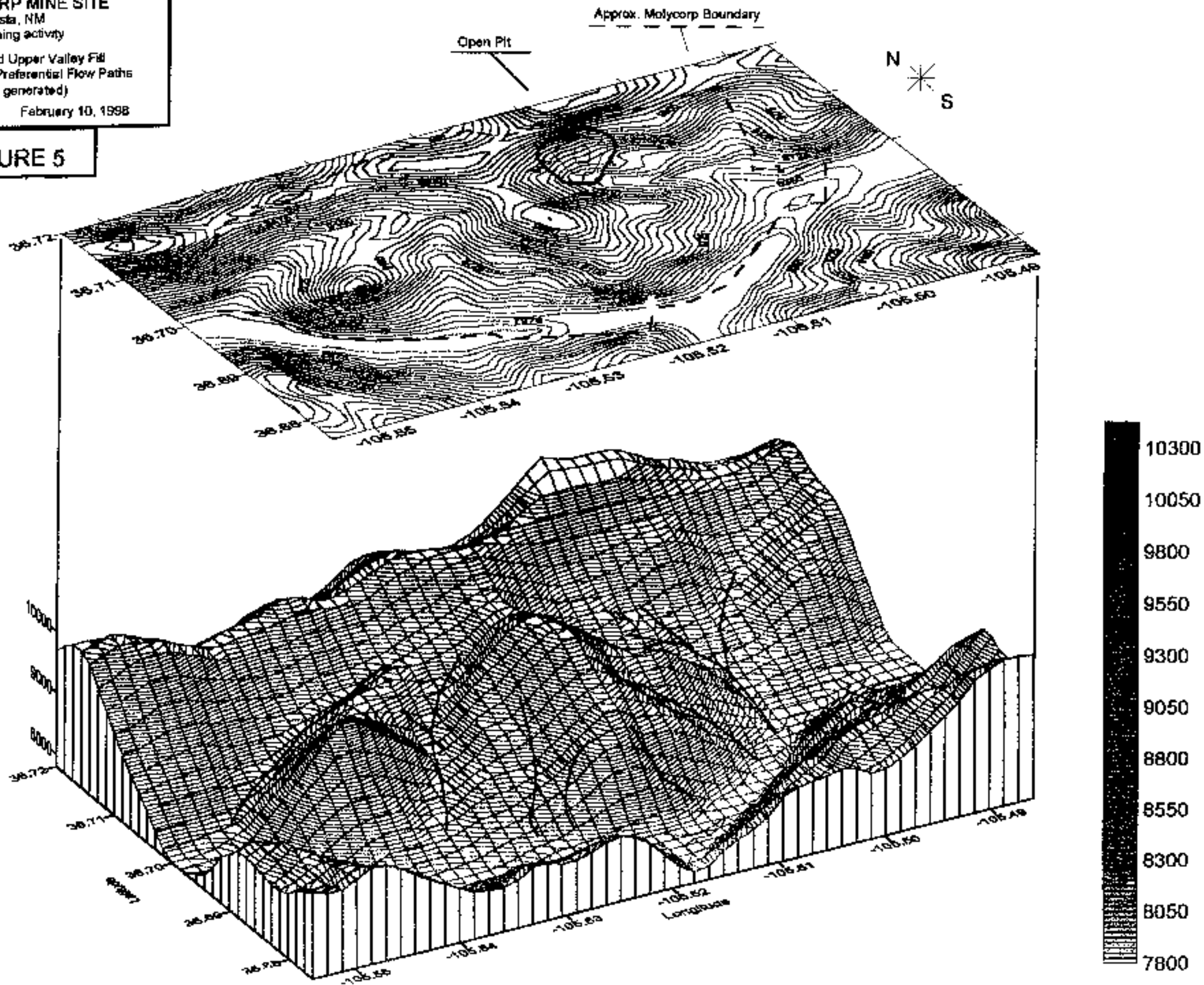
Pre-mining activity

Surface and Upper Valley Fill
Groundwater Preferential Flow Paths
(Surfer generated)

USEPA

February 10, 1998

FIGURE 5



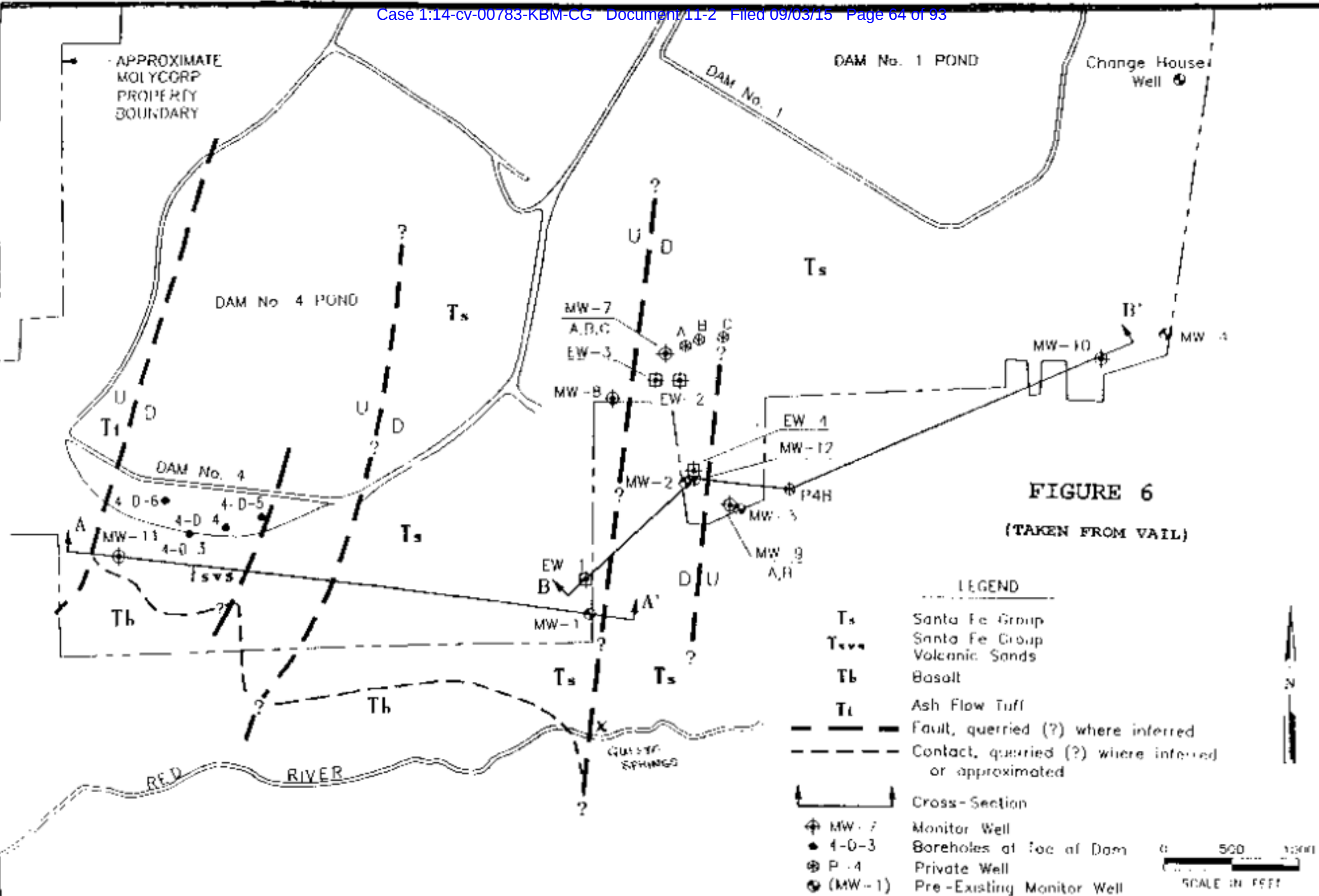


FIGURE 6

(TAKEN FROM VAIL)

LEGEND

T₃ Santa Fe Group

T₄₄₄ Santa Fe Group
Volcanic Sands

Tb Basalt

T₄ Ash Flow Tuff

— — Fault, queried (?) where inferred

--- Contact, queried (?) where inferred
or approximated

Cross-Section

⊕ MW - 7 Monitor Well

- 4-0-3 Boreholes at toe of Dam

Ⓟ P . 4 Private Well

● (MW-1) Pre-Existing Monitor Well

0 500 1000
SCALE IN FEET

SOUTH PASS RESOURCES, Inc.

PROJECT NO.	DATE	AUTHOR	DRAWN BY
001 06	3/31/95		M.O.M.

GEOLOGIC MAP - TAILINGS AREA

Molycorp, Inc.
Questa, New Mexico

UPPER PORTION OF UAU AT DAM No. 1

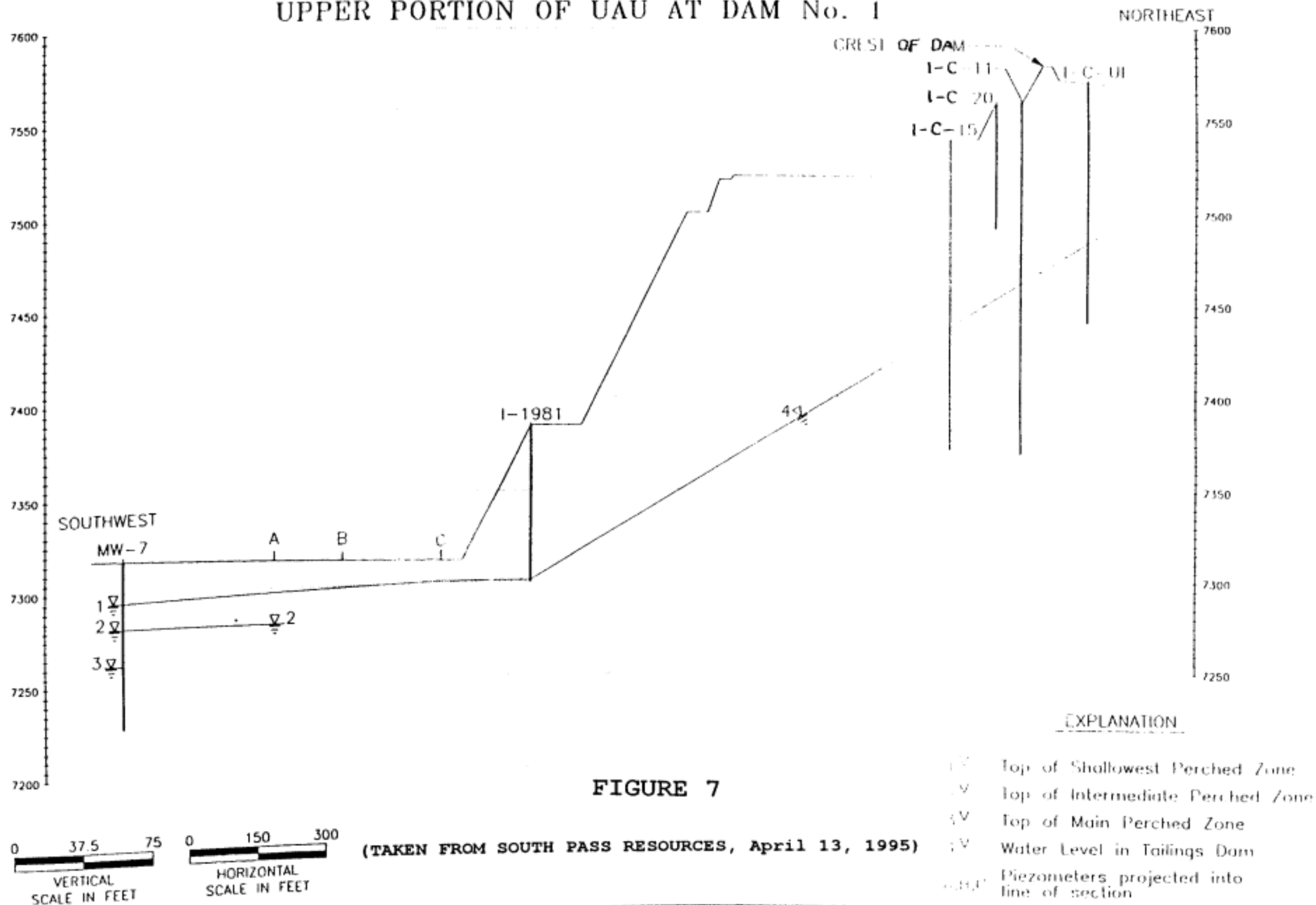


FIGURE 7

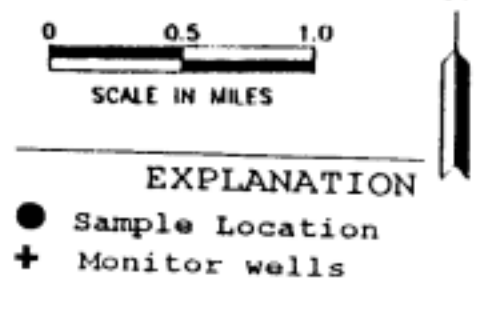
(TAKEN FROM SOUTH PASS RESOURCES, April 13, 1995)

SOUTH PASS RESOURCES, Inc.

WATER LEVELS FOR PERCHED ZONES (APRIL 1993)

Tailings Area - PolyCorp, Inc.
Questa, New Mexico

PROJECT No. 001-06	DATE 3/31/95	AUTHOR M.O.M.	DRAWN BY M.O.M.
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(MODIFIED FROM VAIL, July 9, 1993)

APPENDIX 1

Appendix 1 is an excerpt from the State of New Mexico Standards for Interstate and Intrastate Streams [effective January 23, 1995].

B. Standards:

1. In any single sample: conductivity shall not exceed 300 µmhos, pH shall be within the range of 6.6 to 8.8, temperature shall not exceed 20 C (68 F), and turbidity shall not exceed 10 NTU. The use-specific numeric standards set forth in Section 310 are applicable to the designated uses listed above in Section 2118.A.

2. The monthly geometric mean of fecal coliform bacteria shall not exceed 100/100 ml; no single sample shall exceed 200/100 ml (see Section 1 103.B).

2119. The main stem of the Rio Grande from Taos Junction Bridge upstream to the New Mexico-Colorado line, the Red River from its mouth on the Rio Grande upstream to the mouth of Placer Creek, and the Rio Pueblo de Taos from its mouth on the Rio Grande upstream to the mouth of the Rio Grande del Rancho.

A. Designated Uses: coldwater fishery, fish culture, irrigation, livestock watering wildlife habitat, and secondary contact.

B. Standards:

1. In any single sample: pH shall be within the range of 6.6 to 8.8 temperature shall not exceed 20 C (68 F) and turbidity shall not exceed 50 NTU. The use-specific numeric standards set forth in Section 3101 are applicable to the designated uses listed above in Section 2119.A.

2. The monthly geometric mean of fecal coliform bacteria shall not exceed 100/100 ml; no single sample shall exceed 200/100 ml (see Section 1 103.B).

2120. The Red River upstream of the mouth of Placer Creek all tributaries to the Red River, and all other perennial reaches of tributaries to the Rio Grande in Taos and Rio Arriba counties unless included in other segments.

A. Designated Uses: domestic water supply, fish culture, high quality coldwater fishery, irrigation, livestock watering, wildlife habitat, and secondary contact.

B. Standards:

1. In any single sample: conductivity shall not exceed 400 µmhos (500 µmhos for the Rio Fernando de Taos), pH shall be within the range of 6.6 to 8.8, temperature shall not exceed 20 C (68 F), and turbidity shall not exceed 25 NTU. The use-specific numeric standards set forth in Section 3101 are applicable to the designated uses listed above in Section 2120.A.

2. The monthly geometric mean of fecal coliform bacteria shall not exceed 100/100 ml; no single sample shall exceed 200/100 ml (see Section 1 103.B).

2200. PECOS RIVER BASIN.

2201. The main stem of the Pecos River from the New Mexico-Texas line upstream to the mouth of the Black River.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, secondary contact, and warmwater fishery.

B. Standards:

1. In any single sample: pH shall be within the range of 6.6 to 8.8 and temperature shall not exceed 32.2 C (90 F). The use-specific numeric standards set forth in Section 3101 are applicable to the designated uses listed above in Section 2201.A.

2. The monthly geometric mean of fecal coliform bacteria shall not exceed 200/100 ml; no single sample shall exceed 400/100 ml (see Section 1103.B).

3. At all flows above 50 cfs: TDS shall not exceed 20,000 mg/l, sulfate shall not exceed 3,000 mg/l, and chloride shall not exceed 10,000 mg/l.

2202. The main stem of the Pecos River from the mouth of the Black River upstream to Lower Tansil Dam,¹ including the Black River, the Delaware River and Blue Spring.

A. Designated Uses: industrial water supply, irrigation livestock watering, wildlife habitat, secondary contact, and warmwater fishery.

B. Standards:

1. In any single sample: pH shall be within the range of 6.6 to 9.0, and temperature shall not exceed 34 C (93.2 F). The use-specific numeric standards set forth in Section 3101 are applicable to the designated uses listed above in Section 2202.A.

2. The monthly geometric mean of fecal coliform bacteria shall not exceed 200/100 ml; no single sample shall exceed 400/100 ml (see Section 1 103.B).

3. At all flows above 50 cfs: TDS shall not exceed 8,500 mg/l, sulfate shall not exceed 2,500 mg/l, and chloride shall not exceed 3,500 mg/l.

¹ Diversion for irrigation frequently limits summer flow in this reach to that contributed by springs along the watercourse.

3101. STANDARDS¹ APPLICABLE TO ATTAINABLE OR DESIGNATED USES UNLESS OTHERWISE SPECIFIED IN SUBPART II OF THESE STANDARDS (SECTIONS 2100 through 2805).

A. Coldwater Fishery: Dissolved oxygen shall not be less than 6.0 mg/l temperature shall not exceed 20 C (68 F), and pH shall be within the range of 6.6 to 8.8. The acute and chronic standards set out in Section 3101 .J are applicable to this use. The total ammonia standards set out in Section 3101 .N are applicable to this use.

B. Domestic Water Supply: Waters designated for use as domestic water supplies shall not contain substances in concentrations that create a lifetime cancer risk of more than one cancer per 100,000 exposed persons. The following numeric standards shall not be exceeded:

Dissolved arsenic	0.05	mg/l
Dissolved barium	1 .	mg/l
Dissolved cadmium	0.010	mg/l
Dissolved chromium	0.05	mg/l
Dissolved lead	0.05	mg/l
Total mercury	0.002	mg/l
Dissolved nitrate (as N)	10 .	mg/l
Dissolved selenium	0.05	mg/l
Dissolved silver	0.05	mg/l
Dissolved cyanide	0.2	mg/l
Dissolved uranium	5.0	mg/l
Radium-226 + radium-228	30.0	pCi/l
Tritium	20,000	pCi/l
Gross alpha	15	pCi/l

C. High Quality Coldwater Fishery: Dissolved oxygen shall not be less than 6.0 mg/l. temperature shall not exceed 20 C (68 F), pH shall be within the range of 6.6 to 8.8, total phosphorus (as P) shall not exceed 0.1 mg/l, total organic carbon shall not exceed 7 mg/l, turbidity shall not exceed 10 NTU (25 NTU in certain reaches where natural background prevents attainment of lower turbidity), and conductivity (at 25 C) shall not exceed a limit varying between 300 μ hos/cm and 1,500 μ hos/cm depending on the natural background in particular stream reaches (the intent of this standard is to prevent excessive increases in dissolved solids which would result in changes in stream community structure). The acute and chronic standards set out in Section 3101.J are applicable to this use. The total ammonia standards set out in Section 3101.N are applicable to this use.

D. Irrigation: The monthly geometric mean of fecal coliform bacteria shall not exceed 1,000/100 ml; no single sample shall exceed 2,000/100 ml. The following numeric standards shall not be exceeded:

Dissolved aluminum	5.0	mg/l
Dissolved arsenic	0.10	mg/l
Dissolved boron	0.75	mg/l
Dissolved cadmium	0.01	mg/l
Dissolved chromium	0.10	mg/l
Dissolved cobalt	0.05	mg/l
Dissolved copper	0.20	mg/l
Dissolved lead	5.0	mg/l
Dissolved molybdenum	1.0	mg/l

Dissolved selenium	0.13	mg/l
Dissolved selenium in presence of >500 mg/l SO ₄	0.05	mg/l
Dissolved vanadium	0.1	mg/l
Dissolved zinc	2.0	mg/l

E. Limited Warmwater Fishery: Dissolved oxygen shall not be less than 5 mg/l, pf} shall be within the range of 6.5 to 9.0, and on a case by case basis maximum temperatures may exceed 32.2 C. The acute and chronic standards set out in Section 3101.J are applicable to this use. The total ammonia standards set out in Section 3101.M are applicable to this use.

F. Marginal Coldwater Fishery: Dissolved oxygen shall not be less than 6 mg/l on a case by case basis maximum temperatures may exceed 25 C and the pH may range from 6.6 to 9.0. The acute and chronic standards set out in Section 3101.J are applicable to this use. The total ammonia standards set out in Section 3101.N are applicable to this use.

G. Primary Contact: The monthly geometric mean of fecal coliform bacteria shall not exceed 200/100 ml, no single sample shall exceed 400/100 ml, pH shall be within the range of 6.6 to 8.8 and turbidity shall not exceed 25 NTU.

H. Warmwater Fishery: Dissolved oxygen shall not be less than 5 mg/l temperature shall not exceed 32.2 C (90 F), and pH shall be within the range of 6.5 to 9.0. The acute and chronic standards set out in Section 3101.J are applicable to this use. The total ammonia standards set out in Section 3101.M are applicable to this use.

I. Fish culture, secondary contact, and municipal and industrial water supply and storage are also designated in particular stream reaches where these uses are actually being realized. However, no numeric standards apply uniquely to these uses. Water quality adequate for these uses is ensured by the general standards and numeric standards for bacterial quality, pH and temperature which are established for all stream reaches listed in Subpart II of these standards (Sections 2100 through 2805).

J. The following schedule of numeric standards and equations for the substances listed shall apply to the subcategories of fisheries identified in Section 3101 of these standards:

1. Acute Standards²

Dissolved aluminum	750	µg/l
Dissolved beryllium	130	µg/l
Total mercury	2.4	µg/l
Total recoverable selenium	20.0	µg/l
Dissolved silver ⁴	$e(1.72[\ln(\text{hardness})]-6.52)$	µg/l
Cyanide, amenable to chlorination	22.0	µg/l
Total chlordane	2.4	µg/l
Dissolved cadmium	$e(1.128[\ln(\text{hardness})]-3.828)$	µg/l
Dissolved chromium ⁵	$e(0.819[\ln(\text{hardness})]+3.688)$	µg/l
Dissolved copper	$e(0.9422[\ln(\text{hardness})]-1.464)$	µg/l
Dissolved lead	$e(1.273[\ln(\text{hardness})]-1.46)$	µg/l
Dissolved nickel	$e(0.8460[\ln(\text{hardness})]+3.3612)$	µg/l
Dissolved zinc	$e(0.8473[\ln(\text{hardness})]+0.8604)$	µg/l
Total chlorine residual	19	µg/l

2. Chronic Standards³

Dissolved aluminum	87.0	µg/l
Dissolved beryllium	5.3	µg/l
Total mercury	0.012	µg/l
Total recoverable selenium	2.0	µg/l
Cyanide, amenable to chlorination	5.2	µg/l
Total chlordane	0.0043	µg/l
Dissolved cadmium ⁴	$e(0.7852[\ln(\text{hardness})]-3.49)$	µg/l
Dissolved chromium ⁵	$e(0.819[\ln(\text{hardness})]+1.561)$	µg/l
Dissolved copper	$e(0.8545[\ln(\text{hardness})]-1.465)$	µg/l
Dissolved lead	$e(1.273[\ln(\text{hardness})]-4.705)$	µg/l
Dissolved nickel	$e(0.846[\ln(\text{hardness})]+1.1645)$	µg/l
Dissolved zinc	$e(0.8473[\ln(\text{hardness})]+0.7614)$	µg/l
Total chlorine residual	11	µg/l

K. Livestock Watering: The following numeric standards shall not be exceeded:

Dissolved aluminum	5.0	mg/l
Dissolved arsenic	0.2	mg/l
Dissolved boron	5.0	mg/l
Dissolved cadmium	0.05	mg/l
Dissolved chromium ⁵	1.0	mg/l
Dissolved cobalt	1.0	mg/l
Dissolved copper	0.5	mg/l
Dissolved lead	0.1	mg/l
Total mercury	0.01	mg/l
Dissolved selenium	0.05	mg/l
Dissolved vanadium	0.1	mg/l
Dissolved zinc	25.0	mg/l
Radium-226 + radium-228	30.0	pCi/l
Tritium	20,000.00	pCi/l
Gross alpha	15	pCi/l

L. Wildlife Habitat: The following narrative standard shall apply:

1. Except as provided below in Paragraph 2 of this section, no discharge shall contain any substance, including, but not limited to selenium, DDT, PCB's and dioxin, at a level which, when added to background concentrations, can lead to bioaccumulation to toxic levels in any animal species. In the absence of site-specific information, this requirement shall be interpreted as establishing a stream standard of 2 g/l for total recoverable selenium and of 0.012 g/l for total mercury.
2. The discharge of substances that bioaccumulate in excess of levels specified above in Paragraph 1, is allowed if, and only to the extent that, the substances are present in the intake waters which are diverted and utilized prior to discharge, and then only if the discharger utilizes best available treatment technology to reduce the amount of bioaccumulating substances which are discharged.
3. Discharges to waters which are designated for wildlife habitat uses, but not for fisheries uses, shall not contain levels of ammonia or chlorine in amounts which reduce biological productivity and/or species diversity to levels below those which occur naturally, and in no case shall contain chlorine in excess of 1 mg/l nor ammonia in excess of levels which can be accomplished through best reasonable operating practices at existing treatment facilities.
4. A discharge which contains any heavy metal at concentrations in excess of the concentrations set forth in Section 3101.J.1 of these standards shall not be permitted in an amount, measured by total mass, which exceeds by more than 5 percent the amount present in the intake waters which are diverted and utilized prior to the discharge, unless the discharger has taken steps (an approved program to require industrial pretreatment; or a corrosion program) appropriate to reduce influent concentrations to the extent practicable.

APPENDIX 2

NEW MEXICO GROUND WATER STANDARDS AND U.S. EPA DRINKING WATER STANDARDS FOR ALUMINUM, MANGANESE, MOLYBDENUM, AND SULFATE

Christopher A. King
U.S. EPA Region 6 Ground Water/UIC Section
November, 1997

Currently there are no national ambient ground water quality standards. The United States Environmental Protection Agency (U.S. EPA) drinking water Maximum Contaminant Levels (MCL's) are frequently used as a reference by State and federal agencies when determining clean up levels for individual contaminated sites. The MCL's are for finished drinking water quality, not for raw water quality. States have the authority to develop their own ground water standards related to ambient water quality. Some State ground water standards are the same as U.S. EPA MCL's for finished drinking water. If a U.S. EPA primary or secondary MCL does not exist, a health advisory limit is often used. The State of New Mexico has developed ambient ground water standards for certain inorganic and organic contaminants. These standards represent the maximum allowable concentration of contaminants in the ground waters of New Mexico.

U.S. EPA Drinking Water Standards:

In March 1975 the U.S. EPA proposed the National Interim Primary Drinking Water Regulations under provisions of the Public Health Service Act as amended by the Safe Drinking Water Act. Based in part on Public Health Service regulations developed in 1946 and 1962 and later modified, the interim regulations became final in June 1977, but are continually under review. These federal regulations specify MCL's for finished drinking water supplies and apply to all public water systems. At the recommended maximum contaminant levels, no adverse health effects are known to exist.

MCL's were established for finished drinking water by the Safe Drinking Water Act in two different categories: primary and secondary. Primary MCL's are federally enforceable and based on health risk. The secondary MCL's represent reasonable goals for drinking water quality, but are not federally enforceable. Instead, states are encouraged to implement these standards. Contaminants covered by secondary MCL's are those which may adversely affect the aesthetic qualities of drinking water such as taste, odor, color, and appearance and which thereby may deter public acceptance of drinking water provided by public water systems. Contaminants found at concentrations considerably higher than the secondary MCL may also be associated with adverse health implications (Driscoll, 1989).

New Mexico Ground Water Standards:Aluminum:

The State of New Mexico maximum allowable concentration for aluminum in ground water is 5.0 mg/l. The U.S. EPA currently does not have a primary MCL for aluminum in drinking water, but instead has a secondary MCL of 0.05 to 0.2 mg/l.

Manganese:

The State of New Mexico maximum allowable concentration for manganese in ground water is 0.2 mg/l. The U.S. EPA secondary MCL for manganese is 0.05 mg/l, in order to avoid manganese staining. Stains caused by manganese in plumbing fixtures and laundry are more objectionable and harder to remove than those from iron.

Molybdenum:

The State of New Mexico maximum allowable concentration for molybdenum in ground water is 1.0 mg/l. The U.S. EPA currently does not have a primary or secondary MCL for molybdenum in drinking water, but has issued a health advisory limit of 0.05 mg/l.

Sulfate:

The State of New Mexico maximum allowable concentration for sulfate in ground water is 600.0 mg/l. The U.S. EPA secondary MCL for sulfate is currently 250 mg/l, based upon the laxative effects of sulfate in high concentrations. The secondary MCL for sulfate is under debate, and the U.S. EPA has proposed a primary MCL of 500 mg/l (Federal Register, December 20, 1994).

Sulfate in ground water is derived principally from the evaporite minerals gypsum and anhydrite; it may also come from the oxidation of pyrite, which is an iron sulfide mineral. Ground water in igneous or metamorphic rocks generally contains less than 100 mg/l sulfate (Davis and DeWiest, 1966).

Table 1: Comparison of New Mexico Ground Water Standards and U.S. EPA'S Drinking Water Standards for Finished Water Quality (note: concentrations in mg/l).

CONTAMINANT	New Mexico Standard for Ground Water	U.S. EPA Primary MCL	U.S. EPA Secondary MCL
Aluminum	5.0	none	0.05 - 0.2
Manganese	0.2	none	0.05
Molybdenum	1.0	none	none
Sulfate	600.0	none	250

References:

Davis, S.N., and DeWiest, R.J.M., 1966. Hydrogeology. John Wiley Sons, Inc., New York, NY, 463 p.

Driscoll, F.G., 1989. Ground Water and Wells, Second Edition. Johnson Filtration Systems, St. Paul, MN, pp. 99 - 109.

Fetter, C.W., 1993. Contaminant Hydrogeology. Macmillan Publishing, New York, NY, pp. 11 - 14.

New Mexico Quality Control Commission, December, 1995. State of New Mexico Ground and Surface Water Quality Protection Regulations (20 NMAC 6.2) and Utility Operator Certification Regulations (20 NMAC 7.4). pp. 23 - 25.

One Hundred Fourth Congress, United States of America, 1996. Safe Drinking Water Act Amendments of 1996, Section 109.

U.S. Environmental Protection Agency Region 6 Drinking Water Section, May 1997. Current and Proposed National Primary and Secondary Drinking Water Regulations & Health Advisories for Other Contaminants.

Memorandum

To: Rebecca NeriZagal, NM-ONRT
Russ MacRae, USFWS
Penny Luehring, USFS
Karen Cathey, USFWS
Greg Gustina, BLM

Anne Wagner, Molycorp Inc.

CC: Robert Haddad, AGS

From: David Chapman and Carolyn Wagner, Stratus Consulting Inc.

Date: 5/22/2007

Subject: Molycorp Project Implementation Cost Estimates

Below are presented trustee cost estimates for implementing the non-groundwater proposed Molycorp NRDA compensatory restoration projects.

In this memorandum we present detailed descriptions on each of the assumptions used to develop the current cost estimates. At the end of the detailed descriptions, we present in Table A a summary of the Trustees' cost estimates

In developing these cost estimates, we have included an overall project contingency of 20% to account for unforeseen activities and costs associated with the following projects:

- ▶ Cabresto Fish Barrier
- ▶ Columbine Fish Barrier
- ▶ Fish Hatchery Passage
- ▶ Fawn Lakes
- ▶ Anderson Ranch

Below we provide a summary of the Trustee non-groundwater project implementation costs. The groundwater restoration project cost, in the amount of \$2,500,000, is in addition to these detailed costs.

Summary of Trustee Project Costs Estimate

Projects	Cost
A – Cabresto	\$359,000
B – Columbine	\$248,300
C – Hatchery Fish Passage	\$278,250
D – Fawn Lake	\$135,800
E – Bitter Creek	\$20,000
F – Anderson Ranch	\$37,700

Sub-total \$1,079,050

Unforeseen Contingency and

Oversight Costs - 25% of A, B, C,

D, & F project costs) 20%

\$211,810

Total Non-Groundwater Restoration Costs

\$1,290,860

Cabresto Creek Barrier Restoration Project

Engineering Costs

Design Phase

The Design Phase Estimate is based on use of a conventional engineering analysis and design development process. This includes integration of hydrologic, geotechnical, structural, fish behavioral, and general civil engineering principles to minimize the potential for failure of the proposed facility. This analysis not only minimizes failure of the barrier but also failure by shoreline scour or barrier undermining and passage of the barrier by non-target fish species.

Site Investigation Needs

Hydrologic Needs

Identify or obtain hydrologic information to identify 'high design discharge' at barrier site

Topographic Survey

Identify low and high stream flow water surface elevations and surrounding terrain (optimizes design and assures that construction conforms with design)

Geotechnical Analysis

Conduct site soils investigation to determine bearing capacity and porosity, etc.

\$20,000

Design and Specification

Development of design and barrier construction specifications based on information obtained from the Site Investigation, civil engineering principles, and desired barrier fish objectives.

\$25,000

Engineering Design - Total Costs

\$45,000

Construction Phase

The barrier would consist of a 3' high concrete weir, symmetrical relative to the channel centerline, with flow plunging directly onto a concrete pad at the low design tail water surface. Flow plunging onto this pad would be diverted as sheet flow in the downstream direction at a velocity of over 10 fps and create a hydraulic jump downstream of the plunge pad. As discharge over the weir increases to the high design flow (yet to be determined), it would still not overtop abutment walls on both shorelines. Cutoff walls would extend into the embankment on each shoreline. The weir length and vertical distance from top of abutment walls to the weir crest would be determined by the design high discharge. Sidewalls would extend downstream from both sides of the barrier weir.

At higher weir discharges, depth on the plunge pad would be greater, but downstream velocity would still be high, and fish would have to swim upstream to the plunging flow, then swim over the plunging weir flow to pass the barrier. Details and elevations of this design are not yet reconciled. A 3' vertical drop from forebay to tail water would occur at high design discharge, and would be enough to block non-target species from passing the barrier. The concrete weir could be constructed of either poured-in-place reinforced concrete, or (potentially) 2'x2'x6' pre-cast concrete ecology blocks (such as at the MolyCorp Red River mill water intake diversion dam).

Exclosures

Construction of three exclosures and some channel enhancement (stabilization) upstream of the barrier - costs

\$20,000

Barrier

Barrier Construction - Includes stream flow bypass, excavation, concrete placement, upstream rip-rap placement, mobilization, and demobilization

\$75,000

Engineering Construction - Total Costs

\$95,000

*Monitoring and Maintenance**Monitoring*

Once per year for 3 years - \$500 per trip	\$1,500
Once per 3 years over the next 15 years	\$3,000

Maintenance

\$7,000

Engineering Monitoring and Maintenance - Total Costs
\$11,500

Total Engineering Costs for Cabresto Barrier **\$151,500**

Biological Costs*Fish Removal**Labor*

Includes costs for 2 trips per year (July and September) for 3 years in succession for 5 individuals (3 person crew in lower Cabresto and 2 in upper) with 40 hours each, including 8 hours for travel

\$103,114

Expenses

Includes vehicle, per diem, and misc. \$8,070

Biological Implementation - Total Costs
\$111,184

*Maintenance**Labor*

Includes costs for 4 trips total, one in 5th, 7th, 9th, and 11th years for 3 individuals with 72 hours each, including 8 hours for travel
\$60,746

Expenses

Includes vehicle, per diem, and misc. costs are estimated using Molycorp's expenses per trip for 9 trips \$8,347

Biological Maintenance - Total Costs **\$69,093**

Monitoring

Monitoring costs, based on additional individual weighing and measuring RGCT and one Sr. Biologist analyzing results. Visits occur in all years of removal and maintenance (baseline estimates will occur during removal phase and change estimates during maintenance phase for a total of 7 trips – expenses included in removal and maintenance categories)

\$7,172

Biological Monitoring - Total Costs
\$7,172***Total Biological Costs for Cabresto Barrier******\$187,449*****Permitting Costs***Engineering & Environmental Permitting Costs*

\$20,000

Permitting – Total Costs
\$20,000

<i>Total Estimated Costs for Cabresto Creek Barrier and Restoration Project</i>

\$358,949

Columbine Barrier and Preservation Project

Engineering Costs

Design Phase

The Design Phase Estimate is based on use of a conventional engineering analysis and design development process. This includes integration of hydrologic, geotechnical, structural, fish behavioral, and general civil engineering principles to minimize the potential for failure of the proposed facility. This analysis not only minimizes failure of the barrier but also failure by shoreline scour or barrier undermining and passage of the barrier by non-target fish species.

Site Investigation Needs

Hydrologic Needs

Identify or obtain hydrologic information to identify 'high design discharge' at barrier site

Topographic Survey

Identify low and high stream flow water surface elevations and surrounding terrain (optimizes design and assures that construction conforms with design)

Geotechnical Analysis

Conduct site soils investigation to determine bearing capacity and porosity, etc.

\$25,000

Design and Specification

Development of design and barrier construction specifications based on information obtained from the Site Investigation, civil engineering principles, and desired barrier fish objectives.

\$25,000

Engineering Design - Total Costs

\$50,000

Construction Phase

The barrier would consist of a 3' high concrete weir, symmetrical relative to the channel centerline, with flow plunging directly onto a concrete pad at the low design tailwater surface. Flow plunging onto this pad would be diverted as sheet flow in the downstream direction at a velocity of over 10 fps and create a hydraulic jump downstream of the plunge pad (where there could be either a low profile curb or coarse boulders). As discharge over the weir increases to the high design flow (yet to be determined), it would still not overtop abutment walls on both shorelines. Cutoff walls would extend into the imported fill flood-control embankments on each shoreline. The weir length and vertical distance from top of abutment walls to the weir crest would be determined by the design high discharge. Sidewalls would extend downstream from both sides of the barrier weir.

At higher weir discharges, depth on the plunge pad would be greater, but downstream velocity would still be high, and fish would have to swim upstream to the plunging flow, then swim over the plunging weir flow to pass the barrier. Details and elevations of this design are not yet reconciled. A 3' vertical drop from forebay to tailwater would occur at high design discharge, and would be carefully analyzed to assure enough of a drop to block upstream passage at the barrier. The concrete weir could be constructed of either poured-in-place reinforced concrete, or (potentially) 2'x2'x6' pre-cast concrete ecology blocks (such as at the MolyCorp Red River mill water intake diversion dam).

Barrier

Barrier Construction - Includes stream flow bypass, excavation, concrete placement, upstream rip-rap placement, mobilization, and demobilization

\$75,000

Engineering Construction - Total Costs \$75,000

*Monitoring and Maintenance**Monitoring*

Once per year for 3 years - \$500 per trip \$1,500

Once per 3 years over the next 15 years \$3,000

Maintenance

\$7,000

**Engineering Monitoring and Maintenance - Total Costs
\$11,500**

Total Engineering Costs for Columbine Barrier \$136,500

Biological Costs*Fish Removal**Labor*

Includes costs for 3 trips per year (July, August, and September) for 3 years in succession for 4 individuals with 16 hours each, including 8 hours for travel.

\$43,344

Expenses

Includes vehicle, per diem, and misc. costs are estimated using Molycorp's expenses per trip for 9 trips

\$16,097

Biological Implementation - Total Costs **\$59,441**

*Maintenance**Labor*

Includes costs for 4 trips total, one in 4th, 5th, 6th, and 8th years for 3 individuals with 72 hours each, including 8 hours for travel.

\$20,822

Expenses

Includes vehicle, per diem, and misc. costs

\$4,360

Biological Maintenance – Total Costs **\$25,182**

Monitoring

Monitoring costs, based on additional individual weighing and measuring RGCT and one Sr. Biologist analyzing results. Visits occur in all years of removal and maintenance (baseline estimates will occur during removal phase and change estimates during maintenance phase for a total of 7 trips – expenses included in removal and maintenance categories)

\$7,172

Biological Monitoring – Total Costs **\$7,172**

Total Biological Costs for Columbine Barrier **\$91,795**

Permitting Costs

Engineering & Environmental Permitting Costs \$20,000

Total Permitting Costs for Columbine Barrier **\$20,000**

<i>Total Estimated Costs for Columbine Creek Barrier and Preservation Project</i>	\$248,295
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Upstream Passage for Adult Brown Trout at the Red River Fish Hatchery

Engineering Costs

Design Phase

This will include the engineering site investigations - topography/bathymetry, hydrology, hydraulic, and geotechnical.

Site Investigation Needs

Topography/bathymetry, hydrology/hydraulic, geotechnical studies
\$25,000

Design and Specification

Development of design and construction specifications based on information obtained from the Site Investigation and civil engineering principles. Preparation of Bid documents.
\$35,000

Engineering Design - Total Costs	\$60,000
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Construction Phase

Construction

Construction of fish ladder - includes dewatering and stream flow bypass, ladder and weir cap concrete placement, mobilization, and demobilization.
\$125,000

On-site engineering and inspection during construction
\$20,000

Mobilize/demobilize
\$15,000

Engineering Construction - Total Cost	\$160,000
----------------------------------------------	------------------

*Monitoring & Maintenance**Monitoring*

Once per year for 3 years (2010-2012) - 500 per trip	\$1,500
Once per 4 years between 2016 and 2024 - 500 per trip	\$1,500

Maintenance

Every other year for 15 years - \$1750 per trip	\$12,250
-------------------------------------------------	----------

Engineering Monitoring and Maintenance – Total Costs
15,250

Total Engineering Costs for Fish Hatchery Fish Passage Project **\$235,250**

Biological Costs*Monitoring**Labor*

Includes costs for 3 trips total: one in 4th, 7th, and 10th yr.
Costs based on: 10 hrs for a Sr. Ecologist, and 40 hrs each for a Fisheries Biologist, an Environmental Specialist, and a Fisheries Tech 1

\$9,140

Expenses

Includes vehicle, per diem, misc, and depreciation of supplies

\$3,860

Total Monitoring Phase Costs **\$13,000**

Total Biological Costs for Fish Hatchery Fish Passage Project **\$13,000**

Permitting Costs*Engineering & Environmental Permitting Costs*

Estimated Costs assume a 404 permit, EA from the USFS, permits from the state engineers office

\$30,000

Total Permitting Costs for Fish Hatchery Fish Passage Project **\$30,000**

<i>Total Estimated Costs for Fish Hatchery Fish Passage Project</i>	\$278,250
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Fawn Lakes Riparian Enhancement Project**Engineering Costs***Design Phase*

Rosgen Survey	\$10,000
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Engineering Design – Total Costs	\$10,000
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Construction Phase

Remove earthen access ramp and asphalt pad (approx. 300 sq. ft, transition from the highway), restore to natural grade and highway embankment gradient. These amounts to approx. 1,100 cu yd of spoil, to be hauled to the USFS Ranger Station and stockpiled	\$32,000
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Rock weirs and material/transport	\$15,000
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Place guardrail at highway	\$1,500
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Protect the power pole in the floodplain from flooding damage	\$500
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Mobilize and demobilize	\$15,000
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Engineering Construction – Total Costs	\$64,000
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<i>Total Engineering Costs for Fawn Lakes</i>	<i>\$74,000</i>
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Biological Costs*Implementation*

Re-plant to natural vegetation after fill removal, including stabilization of the disturbed area from potential flood flows and protection with a layer of filter cloth and overlying river rock.
\$9,800

Remove 10 spruce trees over 6-8 acre area, excavate in primary and flood channels, place root wads from trees in channels and back fill to anchor root wads in the stream channels
\$10,000

Remove small trees (thinning) and spruce branches, place in brush piles (improve squirrel habitat).
\$10,000

Biological Implementation – Total Costs \$29,800

Monitoring

Includes monitoring vegetation density, diversity, and health
\$17,000

Biological Monitoring – Total Costs \$17,000

Total Biological Costs for Fawn Lakes \$46,800

Maintenance Costs

For planting or regrading (both engineering and biological – labeled as engineering maintenance costs in summary table)
\$5,000

Permitting Costs

Estimated Costs assume a 404 permit, FONSI from the USFS, permits from the state highway department
\$10,000

Permitting – Total Costs \$10,000

<i>Total Estimated Costs for Fawn Lakes Riparian Enhancement Project \$135,800</i>

Anderson Ranch Wetland Preservation Project

Please note that these costs do not include BLM's environmental assessment and other associated transfer costs. Those costs will be included in the BLM's oversight sheets.

Engineering Costs

No engineering construction costs associated with this project. Molycorp will survey land and transfer to Trustees with specified fence in place.

Monitoring & Maintenance

Monitoring

Assumes monitoring every other year from 2010 to 2016 (8 trips) @ \$500 per trip

\$4,000

Maintenance

\$9,500

Engineering Monitoring and Maintenance – Total Costs
\$13,500

Total Engineering Costs for Anderson Ranch Wetland Preservation Project \$13,500

Biological costs

Monitoring

Includes monitoring vegetation density, diversity, and health.	\$24,200
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Biological Monitoring – Total Cost	\$24,200
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Total Biological Costs **\$24,200**

Total Estimated Costs for Anderson Ranch Wetland Preservation Project \$37,700

Table A Trustee 4/13/07 Cost Estimate (Non-discounted costs)

Projects	Engineering Design Costs	Engineering Construction Costs	Engineering Maintenance & Monitoring Costs	Biological Implementation Costs	Biological Maintenance Costs	Biological Monitoring Costs	Engineering Permit Costs	Sub-total
A – Cabresto	\$45,000	\$95,000	\$11,500	\$111,200	\$69,100	\$7,200	\$20,000	\$359,000
B – Columbine	\$50,000	\$75,000	\$11,500	\$59,400	\$25,200	\$7,200	\$20,000	\$248,300
C – Hatchery Fish Passage	\$60,000	\$160,000	\$15,250			\$13,000	\$30,000	\$278,250
D – Fawn Lake	\$10,000	\$64,000	\$5,000	\$29,800		\$17,000	\$10,000	\$135,800
E – Bitter Creek								\$20,000
F – Anderson Ranch	\$0	\$0	\$13,500			\$24,200		\$37,700
TOTAL	\$165,000	\$394,000	\$56,750	\$200,400	\$94,300	\$68,600	\$80,000	\$1,079,050
Unforeseen Contingency and Oversight Costs - 25% of A, B, C, D, & F project costs							20%	\$211,810.00
Total Non-Groundwater Restoration Costs								\$1,290,860

Exhibit B
to
Plaintiffs' Memorandum in Support of
Motion to Enter Consent Decree

U.S. and New Mexico v. Chevron Mining, Inc.,
No. 1:14-cv-783, D.N.M.

Public Comments Received


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EXHIBIT B-1

Comments from William L. Owen (Oct. 15, 2014)

William L. Owen
Attorney at Law, Retired



Assistant Attorney General
U.S. Department of Justice
DOJ—Environmental & Natural Resources
Division,
P.O. Box 7611
Washington, DC 20044-7611

October 15, 2014

Re: Additional Comments and Objections to portions of Proposed Consent Decree;
United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783
KBM-SCY)
D.J. Ref. No. 90-11-2-07579

Dear Trustees:

On September 19, 2014, I electronically submitted a letter of objections dated September 18, as well as additional comments asking for an extension of the comment period. I also requested that a copy of the complete “administrative record” be made available here in Taos County. Thank you for providing an additional comment period and filing a copy of the record at the Questa Public Library. Based upon a review of the record, much of which has never previously been made available to the general public, I have additional comments.

My comments can be summarized as follows:

1. The “administrative record” confirms that prior to filing the proposed decree in this action, the only written “determinations” which the trustees have made are those contained in the August, 2003 Preassessment Screen, discussed in my prior comments. In other words, for the last 11 years the trustees have failed (1) to “determine” the “injury” to natural resources; (2) to “quantify” and “determine damages” to natural resources; nor have they (3) “determined” a Restoration and Compensation Determination Plan as set out in 43 Code of Federal Regulations section 11.10 et. seq., Natural Resources Damage

Assessments.¹ In fact, the record is devoid of any actions by the trustees since approximately May of 2007, when they apparently met, but, took no formal (written) action. Thus, there is no “assessment” of damages (i.e., no substantial evidence) to support the Proposed Decree as it relates to aquatic resources.

2. In the “administrative record” the only dollar estimates related to assessment of natural resource damages were generated by consultants between 2003 and May 2007. All such estimates were based on the assumption that remediation actions would take place within a reasonable time frame. However, as discussed below, this Proposed Decree has languished in a Bermuda Triangle of bureaucratic inaction for more than 7 additional years. During this unexplained time lapse no meaningful damage assessment, nor remediation plans have been formulated. Damage assessment regulations mandate that any dollar settlement account for the time lost to inaction.
3. The record establishes numerous procedural defects in the trustees’ process leading up to the current proposed decree. These include, but are not limited to (1) failure to provide for public involvement, review and comment, during development of a yet to be created assessment plan;² (2) failure to provide “. . . the reasoning and data” supporting Recital R of the Proposed Decree that authorizes releases of hazardous substances into the Red River for the indefinite future;³ (3) the failure of the Proposed Decree sections 15 and 16 to provide for payment by defendant Chevron of “reasonable and necessary costs” of future planning for restoration, rehabilitation, replacement and/or acquisition of equivalent resources;⁴ (4) and failure of the Proposed Decree to provide for payment of interest and damages from the actual date that the “compromise” recommended by the trustees and embodied in the Proposed Decree was reached---i.e., approximately February of 2007.⁵

1. Discussion

a. Trustees have failed to conduct a Natural Resources Damages Assessment?

¹ The trustees may point to 43 CFR section 11.10 which states that the CFR assessment procedures are not “mandatory”. However, when, as here, the regulations are not followed, the determinations of the trustees have no presumption of correctness. Sections 11.10, 11.11 & 11.91(c). Further, though the regulations may not be mandatory, they establish the kinds of analyses and standards that should be followed in order to assess natural resource damages. In any case, in paragraph 16 of the Proposed Decree the trustees cite the regulations in support of their proposed settlement---therefore, any claim that the regulations are not mandatory would seem disingenuous. In this case, my objection is not just that the regulations were not followed, but that the trustees have not acted to “determine” in writing any of the components of an “assessment” of natural resources damages nor a plan to restore, rehabilitate or replace the resources.

² See 43 CFR sections 11.32(c)(1) & 11.80(b)(4).

³ See the requirement of 43 CFR section 11.73(b) requiring that the reasoning and technical data supporting a decision that restoration “is not feasible” be “documented”.

⁴ See 43 CFR section 11.15 (a)(3).

⁵ This assumes that the court confirms the Proposed Decree. The record shows that all analysis of the injury and damages stopped sometime in May of 2007. Interest should be paid from that date forward. 43 CFR 11.15(a)(4), 11.84 (e)(1) & 11.84(g).

The Code of Federal Regulations establishes a process for a “. . . planned and phased approach to the assessment of natural resource damages”. 43 CFR 11.13. The first step in the process is the “preassessment screen” which is “. . . meant to be a rapid review of readily available information that allows the authorized official [trustees] to make an early decision on whether a natural resources damage assessment can and should be performed.” As discussed in my prior comments, the trustees completed the preassessment phase in August of 2003.⁶ Significantly, the administrative record does not reflect any written determinations by the trustees individually or collectively assessing natural resources damages since the August 2003 Preassessment Screen.

It is true that there are several consultant reports prepared between 2003 and May 2007 that were submitted to the trustees, however, the record does not reflect any determinations by the trustees. The most recent document that I could find in the record regarding the administrative process is a paper prepared by Stratus Consulting dated May 22, 2007, concerning “cost estimates”.⁷ The administrative record is devoid of trustee meeting minutes. There are no written plans, determinations or other formal memorials of trustee action from the August 2003 Preassessment Screen until the Proposed Decree was lodged with the court.

When the damage conclusions are as extensive as reflected in the Preassessment Screen, the regulations provide for a “type B” assessment which involves four phases of analysis with specific mandatory determinations. The phases are labeled the “Injury Determination Phase”, the “Quantification Phase”, the “Damage Determination Phase”, and the “Post-Assessment Phase”. In each phase the trustee is required to make determinations based upon prescribed methodologies for collecting data and evidence. Here the record is devoid of any determinations of the trustees establishing the extent and nature of the injury to aquatic resources, nor quantification in present dollar amounts of the costs of restoration or replacement or the future costs of planning for such projects. The record is also devoid of any post-assessment activities, including the presentation of a formal demand of Chevron for compensation related to the “assessed damages”.⁸

To make it clear, the trustees (1) not only failed to make a proper assessment of damages; (2) by their inaction, they made absolutely no assessment. For this reason, there is no substantial evidence to support the trustees’ recommended settlement amount. It should be clear that settling for a dollar amount without first having completed a proper assessment is contrary to law and good sense.

The fact that the trustees have no plan for restoration is clearly stated in the Proposed Decree at paragraph 16, which provides, in relevant part:

“16. Restoration Planning. The Trustees intend to prepare the separate restoration plan describing how the funds dedicated for trustee-sponsored natural resource restoration efforts under this Section will be used. In the course of that preparation,

⁶ The August 2003 preassessment screen was not a cursory review of minimal data. The then existing scientific studies of the Red River and the impacts of mining on aquatic resources was extensive and the discussion of impacts and the trustees conclusions were well supported.

⁷ It should be noted that the Proposed Decree Index of Administrative Record is inaccurate in regard to the dates of papers listed under the heading “Restoration”. The index lists several papers as dated 2/23/2009, however, the original copies of the papers are either undated or, if dated, were prepared between 11/13/2003 and 5/22/07. Most of the papers listed under “restoration” were dated in 2005.

⁸ 43 CFR 11.91

*ONRT will prepare the portion of the restoration plan that relates to ground water resources. As provided by 43 C.F.R. Section 11.93, **the plan will identify how funds will be used for restoration, rehabilitation, replacement, or acquisition of equivalent resources. The plan may also identify how funds will be used to address services lost to the public until restoration, rehabilitation, replacement, and/or acquisition of equivalent resources is completed. The Trustees intend to solicit public review and comment on the restoration plan** and in no event will any project proceed without the public first receiving the opportunity to review the proposed project and submits comments on the proposal to the Trustees and Trustees' considering the comments and finalizing the restoration plan. ***"* [emphasis added]

It is truly ironic that in paragraph 16 of the Proposed Decree the trustees cite 43 CFR section 11.93 as authority for this proposed settlement. That section is part of the "post assessment phase" of the regulations which is the very last phase of the assessment process. The trustees have skipped over the phases that were required prior to "post-assessment". The post-assessment phase assumes that the trustees have already made an "assessment report" following determinations in the "injury determination phase" and the "quantification phase" which establishes the "extent of the injury to the resource in terms of the loss of services that the resource would have provided had the discharge or release not occurred." 43 CFR 11.13 (e)(2).

Under the regulations, the "quantification phase" is then followed by the "damage determination phase" which establishes the level of dollar compensation utilizing valuation methodologies. In the "damage determination phase" the trustees are "required" to develop a "Restoration and Compensation Plan that will list a reasonable number of alternatives for restoration . . . of resources and the related services lost to the public, . . . select one of the alternatives, . . . give the rationale for selecting that alternative, and identify the methodologies that will be used . . . and at the discretion of the [trustees], the compensable value of the services lost to the public" 43 CFR 11.81(a).

Only after the "quantification" and "damage determination phases" does the "post assessment" provision of section 11.93 relied upon in the Proposed Decree kick in. Thus, in simple terms, the trustees are asking the court to allow them to turn the process on its head---settle for a fixed sum, then allow the agencies to deduct their costs of figuring out what to do with whatever money is leftover after they allow public comment and pay themselves from the settlement amount their cost of preparing a restoration plan.

In the present case, the administrative record demonstrates the fact that the trustees have ignored the CFR damage assessment process. The "administrative record" contains no Restoration and Compensation Plan and no "rationale" for, nor selection by the trustees of, any "restoration alternatives". Further, the record is devoid of any evaluation of "services lost to the public", nor is there any indication that the trustees will seek compensation of lost services such as the more than 50 years during which public angling in 15 miles of the Red River has been eliminated (middle stretch) and diminished (lower stretch). See Preassessment Screen at pages 6-8.

As additional evidence of the trustees' disregard of the process, the regulations require public comment and response as part of the formulation of the Restoration and Compensation Plan---thus, the Proposed Decree would settle for a set amount thereby

pre-committing to undetermined “restoration” projects without the required statement of “rationale” and without public participation. Therefore, the Proposed Decree completely short-circuits the public participation requirements of the regulations.

In sum, the Proposed Decree proposes a settlement amount that is unsupported by any proper damage assessment and no “plan” for how the funds would be utilized to restore or otherwise remedy the resource damage and loss of services to the public. Further, as discussed below, the proposed settlement amount is outdated and meaningless due to the more than 7 year delay between trustee activities (2003-May, 2007) and the 2014 lodging of the Proposed Decree with the court.

b. The Process leading to the Proposed Decree is fundamentally flawed.

1. Lack of Public Participation.

As cited in footnote 2, the natural resource damage assessment process assumes that there will be public participation through a comment and response process. This was not done. This was not only a procedural flaw but unwise because many members of the public are intimately familiar with local waters and could have saved time and money that was spent by consultants investigating impractical and unproductive damage mitigation alternatives.

Further, there is a wealth of knowledge of the value of “services” lost to the public due to the mine’s releases of hazardous wastes into the River. In 2010, economist Dr. Eddie Dry presented a paper at the Red River Symposium sponsored by Trout Unlimited and the Red River Restoration Group. Dr. Dry’s report analyzed the economic benefits to the Town of Red River from the Town’s annual expenditure of \$30,000 to stock rainbow trout within Town limits. His analysis concluded that the stocking program benefits the Town’s economy by more than \$1,000,000 annually by attracting tourism and angling activities. Similar benefits could have been expected over the years in the Village of Questa had the Red River fishery that existed before massive open pit mining destroyed the “put and take” fishery that previously existed in the Red River along Highway 38.⁹

As an example of how the trustees have negotiated the proposed settlement “behind the tapestries” without any public input, ONRT executive director Rebecca Neri Zagal made a presentation at the 2010 Red River Symposium. She made no mention of the fact that the trustees had already reached a settlement agreement with Chevron nor of any of the consultant reports prepared for the trustees between 2003 and 2006 that led up to the settlement. Ms. Neri Zagal made no mention of any “restoration alternatives” being considered by the trustees. Thus, trustee secretiveness persisted despite the fact that the Symposium audience contained many knowledgeable

⁹ State Highway 38 is a heavily traveled paved all-weather highway that provides easy public access to the middle portions of the Red River. It should be noted that consultant reports analyzed “alternatives” on tributaries that are accessible only by high clearance vehicles over gravel and dirt “roads” during good weather months. The “baseline” for valuing the Red River resource “loss” should be based on comparison with the public usage of healthy rivers with all weather access. One such river is the Cimarron River section below Eagle Nest Reservoir that is paralleled by Highway 64.

scientists and experts in restoration that might have enlightened the trustees on issues of concern.

2. No substantial evidence supports Recital R of the Proposed Decree.

Recital R of the Proposed Decree would permit Chevron to release hazardous substances into the River indefinitely. The Natural Resources Damage Assessment process allows the trustees to conclude that “restoration is not technically feasible”. However, “. . . **the reasoning and data on which this decision is based shall be documented** as part of the justification for any replacement alternatives that may be considered or proposed.” 43 CFR 11.73(b) [emphasis added]. The trustees have not provided reasoning nor data to support indefinite continuation of hazardous releases into the River. Confirmation of the Proposed Decree would short-circuit the restoration process by a judicial decree unsupported by substantial evidence that restoration is technically infeasible.

In fact, the restoration of the main stem of the Red River is likely “technically feasible” as demonstrated by the successful restoration of the Arkansas River below Leadville, Colorado. A negotiated settlement of \$138.5 million facilitated restoration of the degraded Arkansas to its recent designation by Colorado’s Department of Parks & Wildlife as a “Gold Medal” stream, ranking it as among the elite trout fisheries in Colorado. The Arkansas River clean up dealt with over 2,000 piles of mining slag, tailings and waste rock that were situated in an 18 square mile area.

The court should not approve any decree that declares that the mine may continue to release hazardous wastes into the Red River unless the trustees make the required showing of “technical infeasibility”.

3. Chevron should pay for future costs of restoration planning.

Sections 15 and 16 of the Proposed Decree provide for the trustees to deduct future restoration planning costs from the settlement amount. Such costs are properly covered as recoverable from the responsible party. 43 CFR 11.15(a)(3). Once again this is a flaw of settling with out a proper damage assessment and no adopted “plan” regarding restoration. In reality the total settlement in this matter is \$7.4 million because \$3.4 million has been paid by Chevron for “past costs” of the trustees and their consultants. Despite the costs already incurred the trustees do not have a restoration plan, and under Proposed Decree paragraphs 15 and 16, additional planning costs will be incurred. The trustees have presented no budget for such costs nor for any proposed restoration projects, however, Chevron should pay for reasonable future planning costs as provided by law.

4. If this proposed settlement is approved, Chevron should be required to pay interest on the award and additional “loss of resource” damages from the effective date of the settlement (2007).

As I stated in my September 19 email transmittal, in 2010, was told in a telephone call that I placed to Rebecca Neri Zagal, executive director of the

New Mexico ONRT, that a settlement had been reached. This was confirmed in a telephone conversation later that day by New Mexico Deputy Attorney General Seth Cohen. Both told me that a settlement had been reached and would soon be lodged with the federal district court.¹⁰ I was told that the only hang up was wording then under review by the Department of Justice to allow Chevron to continue releasing hazardous waste into the River. I asked how the language authorizing hazardous releases could circumvent the Clean Water Act and state water quality requirements. I was given no response. Neither Ms. Neri Zagal nor Mr. Cohen would discuss the dollar amount of the “settlement”.

Upon review of the administrative record, it appears that a settlement was reached much earlier than 2010. In a Stratus Consulting power point presentation for a trustees meeting of November 9, 2006, a “timeline” reflects that the planned date for lodging the “consent decree” was February 1, 2007. The timeline for agreeing on “costs”, “proposed consent decree language” and identifying contents of the administrative record is stated to be November 30, 2006.

These dates when the trustees effectively agreed to a settlement amount for Red River natural resource damage claims are consistent with the dates of technical consultant reports which ceased to be produced in May 2007.

If the trustees’ Proposed Decree goes forward, it should provide that Chevron pay interest on the agreed amount from the date that agreement was reached. However, if the natural resource assessment process is to be respected, the Proposed Decree should be rejected because the law requires that the assessment of damages be based upon the time that the resource and its “services” have been damaged and unavailable. See, e.g., 43 CFR 11.84(e) & (g).

Not only have the trustees failed to properly determine the compensation in the manner that the law requires, but all the consultant reports to the trustees related to damages and the costs of various restoration alternatives are erroneous. Without conceding their original accuracy, all consultant damage and cost estimates are on their face outdated, having been prepared between 2003 and May 2007. Those estimates were based on the belief that restoration projects would be underway without delay. Accordingly, all time and dollar calculations are completely thrown out of whack by the inordinate delay in

¹⁰ What is the explanation for the 7 to 8 year delay in lodging the Proposed Decree? In the last several months Chevron was successful in persuading a New Mexico water quality commission to relax the standards for aluminum. As shown in the Preassessment Screen, aluminum (as well as several other toxics) released from the mine exceeded water quality standards. Aluminum is well-known as a toxic for benthic invertebrates, the necessary “fish food” for a healthy trout population. It is also well known that rainbow trout are highly sensitive to aluminum. The change in the standard for aluminum is controversial because many believe that it was based on pseudo-science and political influence. I believe that the delay of over 7 years in lodging the consent decree is based on the time that it took Chevron to get the aluminum standard changed. It has also been stated that the delay was attributable to interagency squabbling over which agency would administer the groundwater portion of the settlement funds. In any case, the settlement should not be approved without significant adjustments for time lost and the time that it will take in the future to plan and implement restoration projects.

lodging the Proposed Consent Decree. Though the amounts in the 2003-2007 consultant dollar estimates are debatable, it is without doubt that all estimates are outdated by time, inflation and because they do not consider the additional damage to the public due to the more than 7 years in which the public has been deprived of restored resources.

For all the reasons stated above, I object to the portion of the proposed "Consent Decree" setting aside \$1.5 million to compensate for injuries, including those to aquatic resources of the Red River. As previously stated in my prior objections, I request:

1. That the \$1.5 million portion of the decree be rejected (by the Court, if necessary) as inadequate; and
2. that settlement of the aquatic resource portion of the Proposed Decree be delayed until the Office of Natural Resources Trustee and/or the federal Trustees, after public input, develop a restoration plan (with budget) and either negotiate adequate compensation with defendant or litigate the matter.

Respectfully submitted,

William L. Owen,
recovering attorney

EXHIBIT B-2

Comments from William L. Owen (Sept. 19, 2014)

Mariani, Tom (ENRD)

From: Owen [REDACTED]
Sent: Friday, September 19, 2014 12:18 PM
To: ENRD, PUBCOMMENT-EES (ENRD)
Subject: Re-submission, Objections and Comments

Assistant Attorney General,
Environment and Natural Resources Division

Yesterday I filed (by email) comments and objections to a proposed Consent Decree. Today I was provided a copy of the Federal Register pertaining to such matter and note that yesterday's submission did not contain the required Department of Justice "reference number (D.J. Ref. No. 90-11-2-07579). Therefore I am resubmitting my document as an attachment hereto. I trust that this will cure any procedural error inasmuch as I am leaving this weekend for an extended trip abroad, returning on October 11, 2014.

I would like to add the following additional comments to the record:

The 30 day comment period for this matter is unreasonably short as it effectively precludes informed public comment. The "administrative record" in this matter is voluminous and technical in nature. In addition, in the past 5 years there has been no rush by the trustees to push this matter forward. In 2010 I had separate telephone conversations with Rebecca Neri-Zagal, executive director of the New Mexico ONRT and with Seth Cohen, a State Deputy Attorney General. Both told me that a settlement had been reached and would soon be lodged with the federal district court. I was told that the only hang up was wording to allow Chevron to continue releasing hazardous waste into the River. I was told that the wording was under review by DOJ. Neither Ms. Neri-Zagal nor Mr. Cohen would tell me the amount of the settlement nor would they provide any discussion of what restoration or compensation would be "planned" to remedy damage to the in stream resources.

Since there has been at least a 4 year delay in arriving at a settlement document, I can hardly see the harm in providing the public an extended comment period of at least 90 days during which requests for public documents could be made. In addition, it would be a great public service if the entire administrative record were made available here in Taos County (in a public library or electronically).

Very truly yours, William L. Owen

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

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EXHIBIT B-3

Comments from James P. Morgan (Sept. 26, 2014)

MARIANI, THOMAS

James P. Morgan



DEPT. OF JUSTICE - ENRO
ENVIRONMENT DIVISION
14 SEP 30 AM 1:57

Assistant Attorney General
U.S. Department of Justice
DOJ—Environmental & Natural Resources Division
P.O. Box 7611
Washington, DC 20044-7611

September 26, 2014

Re: Proposed Consent Decree; United State of America and State of New Mexico v. Chevron Mining, Inc.
(Action No. 14cv783 KBM-SCY) D.J. Ref. No. 90-11-2-07579. Public Comment.

Trustees:

I would like to make comment on the Proposed Consent Decree referred to above.

I am a retired educator and research scientist (Chemist). I am actively involved with various volunteer groups operating in northern New Mexico who engage in water quality monitoring and in stream restoration projects. I do not speak for them in my comments.

I have read a copy of the Consent Decree obtained from The New Mexico ONRT website. I have also reviewed the Preassessment Screen and Determination for Molycorp, Inc. that was prepared by the Trustees in 2003.

My comments :

There is no way that the public can make a reasoned comment on the Proposed Consent Decree when there is no easily accessible information in the decree that details how the settlement terms were determined. There does not seem to be a relationship to the preassessment screening and determinations of detailed environmental damage done by the Molycorp Inc. mining operations and the settlement terms.

Delay the public comment period until such time that sufficient and understandable information is presented by the Trustees which will allow the public to properly review the matter.

Regards,

A handwritten signature in cursive script that reads "J. P. Morgan".

James P. Morgan, Ph.D.

CORR 90-11-2-07579

EXHIBIT B-4

Comments from Stephen Schmidt (Sept. 28, 2014)

From: [Stephen Schmidt](#)
To: [ENRD, PUBCOMMENT-EES \(ENRD\)](#)
Subject: Chevron settlement
Date: Sunday, September 28, 2014 3:09:24 PM

I am writing in concern of the recent settlement between the state and Chevron Mining Inc that was for \$4 million. This seems like a totally insignificant amount of money in relation to the job required to mitigate the damages caused by the mine. I would like to see the comment period expanded to allow others to become aware of this settlement and to look into how this was determined. Having kayaked the Red River a number of times over the years I am aware of just a small amount of impact the mine has had much less all the other areas it has affected I have not been in.

Sincerely

Steve Schmidt
[REDACTED]
[REDACTED]



Please consider the environment before printing this e-mail

EXHIBIT B-5

Comments from Nicole de Jurenev (Sept. 29, 2014)

From: [Nicole de Jurenev](#)
To: [ENRD, PUBCOMMENT-EES \(ENRD\)](#)
Subject: Extension of Comment Period
Date: Monday, September 29, 2014 3:44:52 PM

In the matter the Settlement for the State of New Mexico v. Chevron, please extend the comment period so the methodology used for the settlement may be properly reviewed.

Thank you,
Nicole de Jurenev

[REDACTED]

[REDACTED]

EXHIBIT B-6

Comments from H. William Adkison (Oct. 2, 2014)

From: [Bill Adkison](#)
To: [ENRD.PUBCOMMENT-EES \(ENRD\)](#)
Cc: pubcomment-33s.enrd@usdoj.gov
Subject: US and NM v Chevron Mining, Inc., D.J. Ref. No. 90-11-2-07579
Date: Thursday, October 02, 2014 5:50:40 PM

To whom it may concern,

I have recently become aware of proposed consent decree concerning the Red River vis a vis Chevron "Moly Mine" and the State of NM.

I request that the public comment period be extended by 120 days. Furthermore, I request that the public be given information about how to access the extensive published information pertinent to this settlement.

As a fisherman, boater, hiker, and local resident, I am particularly concerned with the status of the Red and Rio Grande rivers. I have not been able to find, for example, how much of the \$4 million settlement will be used to actually rehabilitate the Red and Rio Grande. What studies have been done to estimate the damage to the watershed, fish, and aquatic insects?

Should there be additional notices, I request that my email address be included in the list of "interested parties".

Thank you,

H. William Adkison, M.D.

EXHIBIT B-7

Comments from Scott Moore (Sept. 30, 2014)

From: [Scott Moore](#)
To: [ENRD, PUBCOMMENT-EES \(ENRD\)](#)
Subject: Extend the public comment period on the Questa Mine
Date: Tuesday, September 30, 2014 11:55:28 AM

To whom this may concern,

The recent court decision on the settled amount to repair the distrust of the facts of the Chevron Molidium mine in Questa New Mexico represents An environmental travesty and a woefully inadequate amount of money that Chevron is left responsible for. This mine and it's related activities has set the stage of a thousand years worth of degradation to the landscape and the waters.

As a citizen of Taos county and a former resident of Questa, I am poor you to extend the public comment period, and reconsider the dude judicial decision of money required for the cleanup of this mine which should extend into perpetuity.

This decision has not been widely available to the local community of northern New Mexico, and I became aware of the situation through the good work of Amigos Bravos.

If this decision is left to stand I am concerned that it will greatly affect the health of the people and the grand wilderness of already a already disenfranchised part of northern New Mexico.

Sincerely,

Scott J Moore

EXHIBIT B-8

Comments from Taos County Administrator (Oct. 1, 2014)



Taos County Administration

105 Albright Street, Suite G, Taos, New Mexico 87571

Telephone: (575) 737-6300 Facsimile: (575) 737-6314 www.taoscounty.org

October 1, 2014

Assistant Attorney General
U.S. Department of Justice
DOJ—Environmental & Natural Resources Division
P.O. Box 7611
Washington, DC 20044-7611

Daniel R. Barrone
District 1

Larry Sanchez
District 2

Gabriel J. Romero
District 3

Tom Blankenhorn
District 4

Joe Mike Duran
District 5

Stephen P. Archuleta
County Manager

Re: Request for Extension of 30-day Comment Period on the Proposed
Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No.
14cv783 KBM-SCY) D.J. Ref. No. 90-11-2-07579

Dear Madame/Sir;

I write on behalf of the Taos County Board of Commissioners and over 33,000 Taos County residents to respectfully request for an extension of the comment period regarding the above referenced proposed consent order.

Taos County and its officials are deeply concerned about the protection and restoration of the Red River from impacts of historic and current mining operations has been a major focus of our work. Taos County should be a party of interest in all public regulatory proceedings regarding the Chevron Mining Inc. (CMI) Questa molybdenum mine, including CERCLA, USEPA-issued Clean Water Act permits,

New Mexico groundwater permits DP-933 and DP-1055, and the New Mexico Mining Act permit TA001RE. Currently, mining consultant Kuipers and Associates (Montana) is representing Amigos Bravos on the Technical Working Group (TWG) set up by CMI to help develop reclamation alternatives to meet CERCLA requirements. Other parties to the TWG include US-EPA, NM Environment Department (NMED), NM Mining and Minerals Division (MMD), and the Village of Questa and Taos County.

In each regulatory proceeding Taos County is asking that we be allowed to provided technical and legal expertise to represent the cultural, spiritual, fishing, farming and recreational interests of our community that have been harmed by CMI operations. Our focus has been to stop and mitigate resource damages to the aquatic and riparian habitats of the Red River.

Taos County first contacted the New Mexico Office of Natural Resources Trustee (ONRT) in 2002 and offered our assistance in the prosecution of resource damage claims caused by what was then known as the Molycorp Questa mine. Despite subsequent offers to provide expertise and resources, Taos County was never asked to participate in the development of the Consent Order. The Consent Order released to the public on September 5th does not detail how the conclusions presented in the document were generated. There is no information on how the analysis to determine the extent and nature of the injuries was conducted. In addition there is no information about the methodologies that were used to determine fair compensation for injuries to natural resources attributable to the Chevron/Molycorp Mine. In our estimate, it will take a minimum of an additional 30 days for Taos County and its Consultants to adequately represent the interests of our community by providing informed comments in this proceeding.

For all of the above reasons Taos County formally and respectfully requests that the comment period for this Consent Order be extended to October 31, 2014.

Thank you for taking this request into consideration,

Sincerely,

A handwritten signature in black ink, appearing to read "S. P. Archuleta", written in a cursive style.

Stephen P. Archuleta
County Manager

Cc: Office of Natural Resources Trustee
Senator Tom Udall
Senator Martin Heinrich
Congressman Ben Ray Lujan

EXHIBIT B-9

Comments from Taos County Administrator (Nov. 26, 2014)



Taos County Administration

105 Albright Street, Suite G, Taos, New Mexico 87571

Telephone: (575) 737-6300 Facsimile: (575) 737-6314 www.taoscounty.org

November 26, 2014

By Email Only:

pubcomment-ees.enrd@doj.gov

Assistant Attorney General
U.S. Department of Justice
DOJ---Environmental and Natural Resources Division
P.O. Box 7611
Washington, DC 20044-7611

Re: Proposed Consent Decree, United States and State of New Mexico v. Chevron Mining, Inc. (Action No. 14cv783 KBM-SCY)—D.J. Ref. No. 90-11-2-07579

Dear Trustees:

Please note the strong opposition of Taos County to the above referenced Proposed Consent Decree settling the amount to be paid by Chevron due to damages to natural resources caused by the Chevron mine located near the Village of Questa in Taos County, New Mexico in the approximate amount of \$7.6 million (comprised of \$3.4 million already paid to the trustees and an additional \$4.2 million to be paid).

At the core of Taos County's opposition is that it defies common sense to place the settlement value at \$7.6 million. This is a Super Fund site that began operation in 1918. By 1954 it encompassed 35 miles of mine workings. It included a large open pit operation from 1965 until 1982. Nine miles of pipeline transported tailings and water to tailing ponds and in the ten year period from 1966-1976 alone up to 80 spills were reported from the pipeline. There are more than 100 million tons of fine grained tailings in the ponds. Both federal and state environmental agencies have found contamination of the ground and water by multiple hazardous substances well in excess of applicable standards both on and off the mine property.

It is inconceivable that the damage to natural resources from such a legacy of contamination has a settlement value of \$7.6 million. The Proposed Consent Decree offers no explanation of the factual basis for the assessment of damages. The fatal flaws in the Proposed Consent Decree have been well documented by others who have commented at length. Their well-reasoned comments are incorporated into this letter by reference¹, and in the interest of brevity, with the exception of the brief comments that follow, they are not repeated.

¹ William L. Owen submitted objections dated September 18, 2014 and October 15, 2014. Brian Shields of Amigos Bravos submitted objections dated September 25, 2014, October 6, 2014, and November 25, 2014.

Daniel R. Barrone
District 1

Larry Sanchez
District 2

Gabriel J. Romero
District 3

Tom Blankenhorn
District 4

Joe Mike Duran
District 5

Stephen P. Archuleta
County Manager

For all of the above reasons Taos County formally and respectfully requests that the comment period for this Consent Order be extended to October 31, 2014.

Thank you for taking this request into consideration,

Sincerely,

A handwritten signature in black ink, appearing to read "S. P. Archuleta", written in a cursive style.

Stephen P. Archuleta
County Manager

Cc: Office of Natural Resources Trustee
Senator Tom Udall
Senator Martin Heinrich
Congressman Ben Ray Lujan

Mariani, Tom (ENRD)

From: Robert J Malone <legal@newmex.com>
Sent: Wednesday, November 26, 2014 3:24 PM
To: ENRD, PUBCOMMENT-EES (ENRD)
Cc: stephen.archuleta@taoscounty.org; robert.malone@taoscounty.org
Subject: Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc. (Action No. 14cv783 KBM-SCY); D.J. Ref. No. 90-11-2-07579
Attachments: Chevron Mining Ltr 11-26-14.pdf

Assistant Attorney General
U.S. Department of Justice
DOJ---Environment and Natural Resources Division
P.O. Box 7611
Washington, D.C. 20044-7611

To Whom It May Concern:

Attached as a PDF please find a public comment on the above referenced Proposed Consent Decree from Taos County, New Mexico in the form of a letter from the Taos County Manager, Stephen P. Archuleta. The letter is being sent from the private email of the Taos County Attorney, Robert J. Malone, because the Taos County email is currently not functioning. Please do not direct any communications to this email address. Instead, please address any communications to Mr. Archuleta at stephen.archuleta@taoscounty.org and to Mr. Malone at robert.malone@taoscounty.org.

Very truly yours,
Robert J. Malone
Taos County Attorney
575-737-6205

EXHIBIT B-10

Comments from Amigos Bravos (Oct. 6, 2014)



Because Water Matters

105-A Quesnel Street
P.O.Box 238
Taos, NM 87571

Assistant Attorney General
U.S. Department of Justice
DOJ—Environmental & Natural Resources
Division,
P.O. Box 7611
Washington, DC 20044-7611

Via e-mail: pubcomment-ees.enrd@doj.gov

October 6, 2014

Re: Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY) -- D.J. Ref. No. 90-11-2-07579

Dear Trustees:

On behalf of the Amigos Bravos Board of Directors and over 2,000 members, I write to express our concern that the Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc.(CMI), does not adequately compensate for the harm that has been done to us, to the Red River, and to the communities that depend on the health of the Red River. Moreover, I write to formally state that Amigos Bravos and its members are being denied due process in this matter.

Amigos Bravos is a statewide river conservation and water protection organization. Our mission is to protect and restore the waters of New Mexico. We represent 2,000 members in our efforts to restore watershed health, hold polluters accountable and build a river protection movement for the future. Amigos Bravos is guided by social justice principles and dedicated to preserving and restoring the ecological and cultural integrity of New Mexico's water and the communities that depend on it. While rooted in science and the law, our work is inspired by the values and traditional knowledge of New Mexico's diverse Hispanic and Native American land-based populations, with whom we collaborate. Amigos Bravos formed in response to concern about impacts to the Rio Grande and the Red River from Molycorp Inc., which is now CMI. Since 1988 we have advocated continuously for the restoration and protection of the Red River.

As previously stated in our September 25, 2014 letter to you requesting an extension of the comment period, Amigos Bravos was established in 1988 for the sole purpose of protecting and restoring the waters of New Mexico. Since the organization's inception 26 years ago, the protection and restoration of the Red River from impacts of historic and current mining operations has been a major focus of our work. Amigos Bravos has been a party of interest in all public regulatory proceedings regarding the Chevron Mining Inc.

Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY) -- D.J. Ref. No. 90-11-2-07579 – Amigos Bravos
10/6/14 – Page 2

(CMI) Questa molybdenum mine, including CERCLA, USEPA-issued Clean Water Act permits, New Mexico groundwater permits DP-933 and DP-1055, and the New Mexico Mining Act permit TA001RE.

In each regulatory proceeding Amigos Bravos has provided technical and legal expertise to represent the cultural, spiritual, fishing, farming and recreational interests of our members that have been harmed by CMI operations. Our focus has been to stop and mitigate resource damages to the aquatic and riparian habitats of the Red River.

Amigos Bravos first contacted the New Mexico Office of Natural Resources Trustee (ONRT) in 2002 and offered our assistance in the prosecution of resource damage claims caused by what was then known as the MolyCorp Questa mine. Despite subsequent offers to provide expertise and resources, Amigos Bravos was never asked to participate in the development of this Consent Order.

The Consent Order released to the public on September 5th does not detail how the conclusions presented in the document were generated. There is no information on how the analysis to determine the extent and nature of the injuries was conducted. In addition there is no information about the methodologies that were used to determine fair compensation for injuries to natural resources attributable to the Chevron/MolyCorp Mine. In order to review information not provided in the consent order itself Amigos Bravos filed an Inspection of Public Records Act (IPRA) request. On September 23, 2014, in response to the IPRA request, we received numerous Administrative Record documents -- all of which contained dense technical information that will need to be analyzed by our staff and consultants. On September 25, 2014 I sent a letter to you requesting an extension of the comment period. Unfortunately, our request for an extension of the comment period was ignored – it was neither acknowledged, denied nor granted. Consequently, we contend that Amigos Bravos and its members are being denied due process.

We hereby renew our request for an extension of the comment period and, in order to inform the public, we request the opportunity for a public hearing or meeting on this Proposed Consent Decree.

With regards to harm done by the mine to Amigos Bravos and its members, the historical evidence of hazardous waste spills, air emissions, and water contamination through spills and seeps is amply clear and repeatedly stated by State and Federal reports as well as by the mine's own data collection. Eight miles of the Red River have been considered biologically "dead" for decades. The once "blue ribbon" trout fishery has been decimated. Over 100 tailings spills have impacted wetlands, riparian areas and farm lands. Livestock in pastures adjacent and downstream of the tailings site have suffered from molybdenum toxicity. These health and resource impacts from the mine have not only been ongoing but are predicted to continue, albeit at reduced levels, for many decades to come. Members of Amigos Bravos depend on the health of the Red River for their farming, fishing and other sources of income, domestic water use, irrigation of croplands, family recreation, aesthetic pursuits, and spiritual well being.

Telephone: 575.758.3874 -- <http://www.amigosbravos.org/>

Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY) -- D.J. Ref. No. 90-11-2-07579 -- Amigos Bravos
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Amigos Bravos supports the part of this Proposed Consent Decree that compensates for the loss of groundwater resources. However, we have major concerns regarding the \$1.5 million set aside for mitigating impacts to the aquatic habitat of the Red River. First, we have not seen a comprehensive analysis of the evidence gathered by the Trustees to make a claim for damages to the aquatic habitat. The \$1.5 million figure appears to be arbitrary and capricious. The Trustees' Proposed Restoration Alternatives is based on none of the direct damages caused by the mine or the benefits of restoration on the 15 miles of impacted Red River. The "Restoration Alternatives" chosen for analysis in determining the \$1.5 million figure are based entirely on six projects, only one of which will directly benefit the section of river that has been most impacted by the mine -- none of the projects enhance water quantity, water quality or the impacted riparian habitat. The basis for determining the restoration of resource damages on the Red River has nothing to do with compensating those animals, plants and people harmed by the mining operation.

For these reasons, Amigos Bravos requests that prior to approving the Proposed Consent Decree the Court order the Trustees to:

1. Hold a Public Hearing to provide the impacted public with the evidence and analysis that went into establishing the \$1.5 million settlement figure for habitat restoration. As well as to gather evidence from the impacted community regarding resource damages caused by the mine and recommendations for mitigating those damages.
2. Reevaluate damages to water quantity, water quality, riparian habitat, recreational activities and domestic water uses in response to additional information gathered through the public participation process.
3. Recalculate the settlement monetary value of aquatic and riparian resource damages based on public input and the costs of future restoration efforts for projects that will benefit the communities most impacted by those resource damages caused by the mine to the Red River.
4. Enter into new negotiations with CMI based on evidence gathered from the public participation process.

By requiring these steps, the Court will provide Amigos Bravos with the opportunity to address restitution for harm done to our members, as well as ensure that our members are afforded due process.

Thank you for taking our concerns into account.

Respectfully submitted by:



Brian Shields
Executive Director
Amigos Bravos

Telephone: 575.758.3874 -- <http://www.amigosbravos.org/>

EXHIBIT B-11

Comments from William L. Owen (Sept. 18, 2014)

MARIANI, THOMAS

William L. Owen

Assistant Attorney General
U.S. Department of Justice
DOJ—ENRD,
P.O. Box 7611
Washington, DC 20044-7611

September 18, 2014

Re: Comments and Objections to portions of Proposed Consent Decree; U.S. et. al. v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY)

Dear Trustees:

I object to the portion of the \$1.5 million portion of the Proposed Consent Decree ("Consent Decree") that would supposedly compensate for mining damage to surface waters of the Red River, including the loss of aquatic insects and fishery, an injury that has persisted for well over 50 years. In particular, the proposed \$1.5 million figure bears no reasonable relation to the severity of the damage and there is no showing of any "plan" to remedy, restore or replace the lost natural resources of the Red River. In particular, there is no budget, no demonstrated restoration expertise, and no evaluation of natural resource remedies, restoration or replacement. Thus, the \$1.5 million is merely guesswork. A serious effort to remedy, restore or replace the resource loss will require biological and restoration expertise and will require planning, permitting (including the likelihood of NEPA analysis) and implementation skills. Since the decree provides for the deduction of "administrative costs and expenses" of the Trustees, there is very little assurance that any meaningful remediation will in fact occur.

1. Introduction

I am a private citizen, resident of Taos County for the last 19 years. Prior to my retirement, I was a practicing attorney engaged primarily in environmental litigation. My clients included an association of gravel miners, environmental organizations and state and local governments. Starting in about 2005 and until completion of the superfund process, I served as a board member on a citizens committee funded by the EPA. The

001

CORR 90-11-2-67579¹

purpose of the Red River Restoration Committee was to inform citizens of the progress and results of the superfund process for the Chevron/Molycorp mine clean-up.

In June of 2011, the Red River Restoration Committee collaborated with the local chapter of Trout Unlimited to conduct a 2 and one-half day public "symposium" on issues related to the environmental and economic impacts of the Chevron/Molycorp mine. The particular focus of the Symposium was upon the Red River's aquatic resources (particularly benthic insects and fish). Noted experts gave presentations at the Symposium. Attendees and presenters included the New Mexico Environment Department head as well as the staff of the Office of Natural Resources Trustee.

In addition to my former role with the Red River Restoration Committee I am a current member of the local chapter of Trout Unlimited and, starting in October of this year, the New Mexico representative on Trout Unlimited's National Leadership Council

I want to make it clear that I am submitting this objection to the proposed Consent Decree on my own behalf and not in any way on behalf of either the Restoration Committee (which is now inactive), nor on behalf of Trout Unlimited

I would also like to make it clear that I am not objecting to the portion of the Consent Decree that apportions \$2,500,000 to restoration of groundwater resources (e.g., paragraph 6(c)). In addition, I am not objecting to the proposed transfer from the defendant to the Trustees of a 225 acre portion of Anderson Ranch. My understanding is that the transfer is intended to compensate for loss of terrestrial and avian resources attributable to the mining.

2. Objection

As stated more fully above, my objection to the proposed consent decree is that the \$1,500,000 monetary portion of the settlement to address all other injury to natural resources, including aquatic resources, is grossly inadequate. In fact, the amount to address injury will be further reduced by "administrative costs and expenses" required to formulate restoration plans which do not now exist.

3. Discussion

a. What Resource Injuries will be addressed with the \$1,500,000?

Recitals in the Decree pronounce that the Trustees have determined that releases of hazardous substances "are likely to have caused" injuries to natural resources including but not limited to "surface water, ground water [addressed by \$2.5 million payment], terrestrial habitats [addressed by transfer of 225 acres from Anderson Ranch], terrestrial receptors, the aquatic invertebrate community, and fish populations" (Article I, Recital E of the Decree). There is no specific mention of injury to air quality from the "more than 100 million tons of fine-grained tailings in the tailings ponds" that cover 640 acres despite the well known fact that this toxic dust blows into parts of Questa whenever

there is a strong westerly wind. There is also no specific mention of injury to the Red River, acequia irrigation systems and agricultural soils due to the 80 pipeline "spills"¹ from the tailings pipelines (Article I, Recital B).

By deduction, some undisclosed portion of the \$1,500,000 fund that will remain after future agency "administrative costs and expenses" will address "restoration" of injuries to surface water, including the aquatic invertebrate community and fish populations of the Red River. It is unclear whether air quality, damage from "spills" or other natural resource damages will be addressed from such funds.

Setting aside whether any other types of injuries will be addressed by the \$1.5 million, in my opinion the amount of \$1.5 million is inadequate to fairly compensate for decades of past and prospective future mine-related damage to the in-stream resources of the Red River.

b. What are the Injuries to Aquatic Resources (fishery and insects)?

The first issue is what resources have been injured, to what extent and when did the injury occur. In 2003, the Trustee agencies performed a "Pre Assessment Screen" (hereafter referred to as "PAS") to determine the existence and extent of injury to natural resources from mining. (see, reference to the PAS in Consent Decree, Exhibit B, page 3).

The trustees determined that "numerous studies show that the Molycorp mine has contributed to the degradation of the Red River corridor (e.g., Alllen et al., 1999; Abshire, 1998; Slifer, 1996; Kent, 1995). See the PAS at page 6.

With regard to fish populations and recreational opportunities the trustees concluded:

"Fish census data of 1960 indicate that approximately 572 fish per mile were estimated in the river (NMFG, 1960). During the late 1960s and early 1970s the New Mexico Department of Game and Fish discovered in the course of routine population studies that fish were conspicuously absent in the middle reach of the Red River where thriving populations had once existed (EPA, 2001). In 1971, EPA conducted a study of the Red River that concluded that the chemical quality and biological conditions of the Red River were very good but that occasional breaks in the tailings pipeline resulted in some degradation of stream quality and biota (EPA, 1971). The 1988 fish census found no fish in this same reach (NMGF, 1988)." PAS at page 9.

In addition to looking at past injury to the River's resources, it is necessary to look forward in order to evaluate whether the injury will continue. On this point of future injury, the Decree is clear. The proposed Decree states that release of hazardous

¹ The euphemistic term "spills" hardly describes the voluminous volumes of waste materials spewed from breaks in the mine's tailing pipelines. These breaks often impacted the River and its floodplain directly and in many cases inundated acres of fields and irrigation works.

substances by the defendant is assumed to “continue indefinitely into the future” (Recital R). Further, the Trustees (both federal and state) covenant not to sue defendant for future violations of the Clean Water Act. (Article X of the proposed Decree). It should be noted that the Decree reserves the federal and state Trustees the right to sue defendant if there are future releases of hazardous substances “not described in the Administrative Record”. Of course this reservation is meaningless because it is highly implausible that defendant could find any additional hazardous substances to release that are not already documented in the thousand of pages of technical analysis that compose the “Administrative Record” (defined in Article IV, 3. a.).²

Thus, it can be “assumed” that future releases of hazardous substances may continue indefinitely. The environmental effect of this assumption can be gauged by what we know about the past. First, we know that prior to the open pit phase of mining the lower Red River held one of the great trout fisheries of the western United States. (Streit, Taylor, presentation to the Red River Symposium). The lower Red River is that portion beginning just above the Red River Fish Hatchery and extending to its junction with the Rio Grande River. In the 1980s, this section of the Red River was designated as a Wild & Scenic River under the federal legislation of the same name.

As the scope of the open pit operation expanded dramatically in the 70s and 80s, the quality (size and number of wild trout) of the lower River noticeably diminished. (Streit, id.). At the same time the middle section of the Red River from the mine downstream declined as a fishery and ultimately, as stated in the **PAS, (Ibid.)**, field studies verified a complete absence of trout. Other studies have verified the absence of the aquatic insects necessary for a healthy fish population.

Scientific studies of water quality have been conducted over the course of years. The studies verify that the exposed minerals in rock piles produced by mining result in acid run-off including high concentrations of aluminum that is detrimental to the insects and trout. (See the **PAS** pages 6-13). The mining companies have responded to criticisms by pointing upstream to several naturally occurring “scars” where erosion has exposed similar minerals. And, it is true that on occasion a sudden cloudburst can occur that washes these minerals into the River with deadly effect on the trout. One such natural event occurred about 5 years ago when a cloudburst over the scar area resulted in a massive slide closing the highway and depositing large amounts of sediment into the upper Red River (near highway mile marker 10). On that occasion, there was a fish kill downstream. However, these naturally occurring events are unpredictable, highly sporadic and have occurred over eons of time. In this sense, they are no different than the massive wildfires that have been experienced in the last two decades. On several occasions such fires have had devastating effects on wild trout fisheries----however, just

² Perhaps it could be argued that the superfund clean-up will inevitably reduce hazardous releases to the River. However, the pace and scale of the clean-up could take up to 30 or more years. Further, even the mining company’s responsibility to clean up the mess is being challenged in a separate action entitled *Chevron Mining, Inc. v. United States*, as recited in the Consent Decree, Article XX, paragraph 43. Thus, when and if the superfund remedy becomes “effective” is anyone’s guess.

as with the natural scars, after each event (flash flood or wildfire), the trout move back into the habitat once the water has cleared.

Why is this distinction important? It is because the mining argument that "*it wasn't us, it was Mother Nature*" has apparently influenced the resolve of the Trustees to seek full compensation for injury to aquatic resources. It is this argument that the Trustees euphemistically refer to as "risks of litigation". I understand the risks of litigation and I understand the costs of litigation. However, I believe that the Trustees have been too meek in regards seeking adequate compensation for loss of aquatic resources because the answer to their concern is clearly stated in the PAS and in the biological papers cited. Citations to the same scientific papers also appear in Appendix B of the Decree.

In 1998, EPA scientist David Abshire prepared a biological report entitled "Report on Hydrological Connection Associated with MolyCorp Mining Activity, Questa, New Mexico". The paper is discussed in the PAS (at page 6 & 7) and is referenced in the Decree at Appendix B, p. 1. It is my belief that this study is the most definitive description of the difference between fish and aquatic insect injury due to "scars" versus the mine's constant seeps and waste rock discharge.

The Abshire study was initiated to determine "... if mining activities ... are resulting in the discharge of acidic, metal laden ground water to surface water via seeps along the Red River through a ground water hydrological connection." The investigation concluded that the sources of "... the high metals and sulfate concentrations discharged to the river at the mine site are: 1) historic and recent mine waste rock [of which there are 380 million tons of waste rock deposits], 2) erosional scars, 3) remnant deposits of tailings resulting from pipeline breaks, 4) a landfill area at the head of Spring Gulch, 5) the Moly tunnel, 6) the caved area in Goathill Gulch and 7) runoff directed to the underground workings for collection. Of these, the most probable sources are considered to be the WRD [waste rock deposits] and the [mine site] erosional scars ..." (Id., pp. ii & iii).

The Abshire study also makes this all important distinction between "... two general modes of contaminant transport in the mountainous region (which incorporates the mining area) of the Red River watershed: [1] steady-state, and [2] pulse loading." (Id., p.iii). Abshire investigated the first type of transport mode, steady state, by focusing on the "river seeps" from the mine area. (Id., p.ii). And, as stated above, the mine operator often cites contamination from off-site run-off due to heavy precipitation on naturally occurring geologic scars as the source of river problems---however, heavy run-off would be the second type of transport [one such heavy run-off incident is reported in the McCleskey, et.al. 2003 report, referenced in Decree Appendix B, page 7]. Though the "pulse loading" types of transport [caused by events such as heavy precipitation onto naturally occurring geologic scars or tailings pipeline breaks] occur, these "pulse loading" events do not explain away the "steady-state" pollution from the seeps that

Abshire finds are most likely fueled by precipitation onto the mine's waste rock piles, etc., as described above.³

As is typical of environmental issues, each side can develop theories and marshal arguments to support their cause. In the case of the Red River, there are probably more scientific studies than on any other watercourse in the state. But, on this subject of the difference to biological resources from the two different types of event, "steady-state" and "pulse loading" I am not aware of any studies that contradict Abshire's conclusions. To state the obvious, the seepage from the mine rock piles is like a cancer to the River resources, whereas the occasional "pulse" events on the upstream "scar areas", do their damage and then the resources recover.⁴

c. Will the portion of the \$1.5 million remaining after future trustee "administrative costs and expenses" be adequate compensation for decades of damage to the natural aquatic resources of the Red River?

So, what we have is a highly degraded section of River. The trustees 2003 PAS estimated that *"approximately 15 miles of the Red River, from the upper boundaries of the mine to the confluence of the Red River and the Rio Grande, have potentially been exposed to mine-driven contaminants."* (See PAS, at page 8). Further, we have the potential that indefinite continuous future releases of hazardous wastes may maintain injury to the River's natural aquatic resources. It seems to me, that the only way to "compensate" for the loss is to identify projects on other nearby rivers or other sections of the Red River to enhance fishery resources.

With my past involvement with fisheries restoration projects, I am familiar with the complications (such as NEPA and wetlands permits) and costs associated with even small stream habitat projects. Further, stream projects are highly technical and require a level of expertise and experience. In my experience, most of the expertise for designing and implementing effective stream habitat projects resides in private river restoration consulting companies. Costs merely to develop and implement an effective stream habitat plan can be extremely expensive. In order for the trustees to formulate an

³ It should be noted that in the 2003 PAS the trustees had no trouble discounting the persuasiveness of the "natural scar" red herring. See, the discussion and citations to scientific studies at pages 6 and 7 of the PAS. It should be noted that the PAS and the studies which it cites to reject the persuasiveness of the "natural scar" argument are all included in Appendix B of the Consent Decree.

⁴ Any serious angler has encountered situations where fish kills occur due to sudden natural events. And, invariably, the fishery rebounds. One of the most instructive occurrences occurred in the 1980s in northern California. On that occasion, a Southern Pacific tanker car filled with insecticides derailed directly into the upper Sacramento River. The "upper Sac" is a noted blue ribbon trout stream and within hours of the "spill", several miles of the River were devoid of life. The state Department of Fish & Game declared the River a disaster and announced that it would be closed to fishing for 3 years. Yet, the following year it was found that the affected portion of the River had recovered its aquatic insect population and that the trout fishery was fully recovered---presumably by migration of fish upstream from Shasta Reservoir. The Red River has its own "Shasta Reservoir"---namely, the Rio Grande River, a redoubt from which trout can migrate when a natural event occurs in the scar areas. However, the trout will not migrate into a persistent hazard caused by constant releases of hazardous materials every time there is rainfall or snowmelt on the acres of exposed waste rock piles deposited by the mine along the Red River. (See, PAS at pages 6-7).

appropriate amount required for a plan and implementation to compensate for habitat loss, a budget and a concept plan are essential. The proposed Consent Decree gives no comfort that the trustees have evaluated the time and expense of developing a plan. Nor does the Decree provide any comfort that the trustees non-existent (future) "plan" will adequately compensate the public for the identified loss to natural aquatic resources.


Given what has been lost and the period (decades) of the continuous injury, it is my opinion that an adequate aquatic resources remedy will undoubtedly exceed the proposed \$1.5 million of segregated settlement funds. Even if one factors in "litigation risks", there has to be a financial starting point that would constitute full recovery serving as a touchstone for compromise. Here, there is no touchstone for the public resource because there are no identified "restoration plans" nor strategies addressing lost aquatic resources.

b. Conclusion.

For all the reasons stated above, I object to the portion of the proposed "Consent Decree" setting aside \$1.5 million to compensate for injuries, including those to aquatic resources of the Red River. I request:

1. that the \$1.5 million portion of the decree be rejected (by the Court, if necessary) as inadequate;
2. that settlement of the aquatic resource portion be delayed until the Office of Natural Resources Trustee and/or the federal Trustees, after public input, develop a restoration plan (with budget) and either negotiate adequate compensation with defendant or litigate the matter.

Respectfully submitted,



William L. Owen,
recovering attorney

EXHIBIT B-12

Comments from Taylor Streit (Nov. 9, 2014)

From: [Taylor](#)
To: [ENRD, PUBCOMMENT-EES \(ENRD\)](#)
Cc: [REDACTED]
Subject: Re: United States and State of New Mexico v. Chevron Mining Inc. D.J.Ref 90-11-2-07579
Date: Sunday, November 09, 2014 5:34:28 PM

Re: United States and State of New Mexico v. Chevron Mining Inc. D.J.Ref 90-11-2-07579

My name is Taylor Streit and I am in the fly fishing business in Taos and Santa Fe, New Mexico (Taos Fly Shop and Reel Life). I was forced to close Taos Fly Shop in 1987 due to the degradation of the Red and Rio Grande Rivers due to mining pollution from the Questa Moly Mine. (Taos fly shop reopened in 2002)

I am also the author of several books on fly fishing. In my books mention is often made to what was the fabulous fishing that was once on the Lower Red River. My book Fly Fishing New Mexico has sold some 25,000 copies and in the Rio Grande chapter I delineate the fishery, as above or below mine influence, since fish were not able to reach any significant size below the mines influence.

So on a personal level the mine stifled my livelihood for two decades. Let alone the loss to my guides and tourist who no longer came to fish.

The "agreement" by state and federal agencies coming to the conclusion that the Questa mine's environmental responsibilities number 4,000,000 is absurdly low. The figure is lacking a number of zeros at the end. This is a vast superfund site of what was the 2nd largest moly mine in the world!

The figure is insulting low --especially considering that my grandchildren will be dealing with the mine's environment damage for a century more.

Sincerely

Taylor Streit

Taosflyshop.com

[REDACTED]
[REDACTED]

EXHIBIT B-13

Comments from Amigos Bravos (Nov. 25, 2014)



Because Water Matters

**105-A Quesnel Street
P.O.Box 238
Taos, NM 87571**

Sam Hirsch
Assistant Attorney General
U.S. Department of Justice
DOJ—Environmental & Natural Resources Division
P.O. Box 7611
Washington, DC 20044-7611

Via e-mail: pubcomment-ees.enrd@doj.gov

November 25, 2014

Re: Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-RHS) -- D.J. Ref. No. 90-11-2-07579

Dear Mr. Hirsch:

On behalf of the Amigos Bravos Board of Directors and over 2,000 members, I write to thank you for extending the comment period, and to further express our concern that the Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc. (CMI) is outdated, arbitrary in determining compensation for the loss of terrestrial and aquatic resources, sorely lacking in public input, and silent on assessing the loss of business and recreational opportunities due to the release of hazardous waste by the mine.

We formally request that 1) the Consent Decree not be approved at this time, 2) the Court order an update of the Natural Resource Damage Assessment to incorporate new information (see list of documents below), and 3) the impacted community be offered the opportunity to provide testimony that would directly address the effects of hazardous substance releases from the mine to loss of recreational, farming, and business opportunities (this can be done by holding a Public Hearing as we requested in our letter of October 6, 2014).

The Administrative Record Provides an Inadequate Basis
for the Judge to Approve the Consent Decree

We have reviewed the contents of the Administrative Record that were made available to the public at the Questa Public Library on October 24, 2014. From our review of the Administrative Record, we have concluded that the record is out of date and incomplete. The following documents should have been made part of the record and considered by the Trustees:

1. Any new information since 2005 regarding the quantity and extent of releases of hazardous substances, as outlined in:

Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY) -- D.J. Ref. No. 90-11-2-07579 – Amigos Bravos
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- a. *Baseline Ecological Risk Assessment – Final Report*, Molycorp Mine Site Questa, New Mexico, May 29, 2009
 - b. *Baseline Human Health Risk Assessment – Final Report*, Molycorp Mine Site Questa, New Mexico, May 29, 2009
 - c. United States Environmental Protection Agency Region 6 *Record of Decision – Molycorp, Inc. Questa, New Mexico*, December 20, 2010
2. Any record of public participation.
 3. Any record of decisions made by the Trustees to support the Proposed Consent Decree.
 4. Any record of restoration alternatives considered but not proposed.
 5. Any update since 2006 regarding the cost of the proposed restoration alternatives.

There is nothing in the record dated after November 9, 2006 – eight years ago. Years of additional damage have occurred to the Red River that are not addressed in this record yet are settled away under the proposed agreement. Further, there is no rational basis provided in the record for why this settlement was arrived at and is fair and appropriate. We therefore reiterate our previously stated contention that Amigos Bravos and its members are being denied due process in this matter.

Amigos Bravos is an Interested Party with Expertise;
Our Offers of Assistance Have Been Ignored

Amigos Bravos is a statewide river conservation and water protection organization. We represent 2,000 members in our efforts to protect and restore the waters of New Mexico. Amigos Bravos is guided by social justice principles and dedicated to preserving and restoring the ecological and cultural integrity of New Mexico's water and the communities that depend on it. Amigos Bravos formed in response to concern about impacts to the Rio Grande and the Red River from Molycorp Inc., which is now owned by Chevron Mining, Inc. (CMI). Since 1988, Amigos Bravos has advocated for the restoration and protection of the Red River.

As previously stated in our September 25, 2014 and October 6, 2014 letters to you, Amigos Bravos was established for the purpose of representing the public interest in the protection and restoration of New Mexico's water resources. Since the organization's inception 26 years ago, the protection and restoration of the Red River from impacts of historic and current mining operations has been a major focus of our work. Amigos Bravos has been a party of interest in all public regulatory proceedings regarding the CMI Questa molybdenum mine, including CERCLA, USEPA-issued Clean Water Act permits, New Mexico groundwater permits DP-933 and DP-1055, and the New Mexico Mining Act permit TA001RE.

In each regulatory proceeding Amigos Bravos has provided technical and legal expertise to represent the cultural, spiritual, fishing, farming and recreational interests of our members that have been harmed by CMI operations. Our focus has been to stop and mitigate resource damages to the aquatic and riparian habitats of the Red River.

Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY) -- D.J. Ref. No. 90-11-2-07579 – Amigos Bravos 11/25/14 – Page 3

Amigos Bravos first contacted the New Mexico Office of Natural Resources Trustee (ONRT) in 2002 and offered our assistance in the prosecution of resource damage claims caused by what was then known as the Molycorp Questa mine. Despite subsequent offers to provide expertise and resources, Amigos Bravos was never asked to participate in the development of this Consent Order.

The Settlement Regarding Impacts to Aquatic Habitat is Inadequate and Lacks Factual Support

As we stated in our October 6, 2014 comment letter, Amigos Bravos supports the part of this Proposed Consent Decree that compensates for the loss of groundwater resources. However, we have major concerns regarding the \$1.5 million set aside for mitigating impacts to the aquatic habitat of the Red River.

The \$1.5 million figure is not based on current information regarding the quantity and extent of hazardous releases. Instead, the \$1.5 million figure appears to be determined by an arbitrarily chosen set of restoration alternatives unrelated to direct resource damage impacts to farmers, the fishing and recreation industries, or the local residents that depend on the 15 miles of impacted Red River. The “Restoration Alternatives” chosen for analysis in determining the \$1.5 million figure are based entirely on six projects, only one of which will directly benefit the section of river that has been most impacted by the mine – none of the projects enhance water quantity, water quality or the riparian habitat within the area directly impacted by the mine. None of the \$1.5 million will go towards compensating farmers, fishermen or recreationalists for the loss of income from natural resource damages caused by hazardous substance releases from the mine.

A Public Hearing and a New Agreement are Needed

For these reasons, Amigos Bravos requests that prior to approving the Proposed Consent Decree the Court order the Trustees to:

1. Hold a Public Hearing to provide the impacted public with the evidence and analysis that went into establishing the \$1.5 million settlement figure for habitat restoration. As well as to gather evidence from the impacted community regarding resource damages caused by the mine and recommendations for mitigating those damages.
2. Reevaluate damages to water quantity, water quality, riparian habitat, recreational activities and domestic water uses in response to additional information gathered through the public participation process, and an assessment of new data gathered since 2006 in the documents listed above.
3. Recalculate the settlement monetary value of aquatic and riparian resource damages based on public input, and actual 2014 financial costs of future restoration efforts for projects that will benefit the communities most impacted by those resource damages caused by the mine to the Red River.
4. Enter into new negotiations with CMI based on updated evidence, analysis and monetary calculations.

Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY) -- D.J. Ref. No. 90-11-2-07579 -- Amigos Bravos
11/25/14 -- Page 4

By requiring these steps, the Court will provide Amigos Bravos with the opportunity to address restitution for harm done to our members, as well as ensure that our members are afforded due process.

Thank you for taking our concerns into account.

Respectfully submitted by:

A handwritten signature in black ink, appearing to read 'Brian Shields', with a stylized, cursive script.

Brian Shields
Executive Director
Amigos Bravos

EXHIBIT B-14

Comments from Trout Unlimited (Sept. 25, 2014)



Assistant Attorney General
U.S. Department of Justice
DOJ—Environmental & Natural Resources Division,
P.O. Box 7611
Washington, DC 20044-7611

September 25, 2014

Re: Comments and Objections to portions of Proposed Consent Decree; United States and State of New Mexico v. Chevron Mining, Inc., (Action No. 14cv783 KBM-SCY)
D.J. Ref. No. 90-11-2-07579

Dear Trustees:

Trout Unlimited (TU) is a national non-profit organization dedicated to conserving, protecting and restoring North America's coldwater fisheries and watersheds. Our staff and volunteers work on behalf of today's anglers and future sportsmen and women to protect and restore trout habitat and angling opportunity where natural events and human development have impacted coldwater streams and lakes. Dedicated to executing TU's mission, the New Mexico Council of Trout Unlimited (NMTU) represents TU member volunteers living in New Mexico. NMTU is comprised of grassroots representatives from the four TU chapters in the state, the Enchanted Circle Chapter (Taos and Questa area), Truchas Chapter (Santa Fe), Bosque Chapter (Albuquerque), and Gila-Rio Grande Chapter (Las Cruces and southern NM).

TU objects to the portion of the \$1.5 million portion of the Proposed Consent Decree ("Consent Decree") that would ostensibly compensate for mining damage to surface waters of the Red River in northern New Mexico over the past 50 years. This objection is based on several concerns, specifically:

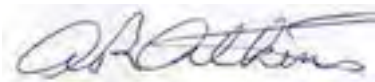
- An assessment (Pre Assessment Screen performed by the Trustee agencies) of past and future surface water damages documents past injury to surface water resources. The same assessment concludes that these injuries, in the form of releases of hazardous substances to the river corridor, are likely to continue through the indefinite future.
- Such perpetual releases will cause persistent degradation of resources – macroinvertebrates (the major food source for trout), stream sediment,

riparian vegetation, floodplain soils, and other components known to be integral to a habitat's ability to sustain trout.

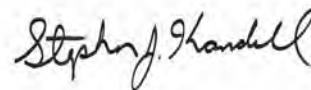
- In the absence of a full, detailed plan for how release sites will be identified, contained, and remediated, of associated river restoration plans, and of estimates on the cost of completing such necessary activities, the proposed \$1.5 million to address future contamination issues seems arbitrary. Given the extent and duration of pollution associated with the Questa mine, it is our opinion that \$1.5 million will also be grossly inadequate to remediate future release site damage.
- Further, efforts to remedy, restore or replace resource losses will require biological and restoration expertise, and planning, permitting, and engineering. The proposed settlement will also be used to cover "administrative costs and expenses" of the Trustees which further diminishes the power of \$1.5 million to achieve significant benefits.

For these reasons, TU and NMTU object to the proposed "Consent Decree" settlement of \$1.5 million as inadequate compensation for past and future injuries to the aquatic resources of the Red River. We request that this portion of the decree be rejected and that settlement of the aquatic resource portion be delayed until the Office of Natural Resources Trustee and/or the federal Trustees, after public input, develops a comprehensive restoration plan and budget as well as a proposed settlement sufficient to execute such a plan.

Thank you



Arnold R Atkins, MD
Chairman
New Mexico Council, Trout Unlimited (NMTU)
12 Vista Grande Drive
Santa Fe NM 87508



Steve Kandell
Director (SCP)
Trout Unlimited
1032 ½ Main Ave, Suite 20
Durango Co, 81201

EXHIBIT B-15

Comments from Dudee Schatzie (Nov. 26, 2014)

Mariani, Tom (ENRD)

From: Davis, Buffy (ENRD)
Sent: Wednesday, November 26, 2014 9:22 AM
To: Mariani, Tom (ENRD)
Subject: PUBLIC COMMENT - DUDEE SCHATZIE

From: Schatzie Dudee [REDACTED]
Sent: Tuesday, November 25, 2014 10:56 PM
To: ENRD, PUBCOMMENT-EES (ENRD)
Subject: U.S., et al v. Chevron Mining, Inc. (Case 1:14-cv-00783-KBM-SCY)

I would like to comment about the above case.

Really? Chevron, a company that had sales and operating revenues of \$220 BILLION dollars in 2013, with net profits of \$21 BILLION dollars in 2013 (<http://www.chevron.com/documents/pdf/corporatefactsheet.pdf>) is being penalized \$4 MILLION dollars for what they did at the Questa Mine site in New Mexico? Are you serious?

In your own Consent Decree, DOJ states that the mine has been polluting that entire area since 1966 (!). They have polluted the precious Red River upstream, downstream, poisoned the ground water, killed off the fish population, damaged terrestrial, invertebrate and any other habitat that might have, or ever will, exist, and they get off with this pathetic excuse for a penalty? Wait. I get it. This tortured mess of a situation is meant, I believe, to accomplish several things. First, it provides cover for the US government which is making Chevron promise they won't continue to sue the US government (now that's moxie!) for ALLOWING them to knowingly pollute. Secondly, the other, possibly more significant stipulation is that Chevron has to sign over 225 acres of oil-rich New Mexico real estate called the Anderson Ranch.

What is going to happen to that piece of land owned by Chevron? I tried very hard to get a straightforward answer about this. Despite phone conversations with several government officials from 3 different agencies (no one knows what will become of the land once the Department of the Interior gets its hands on it), countless emails (which also provided ZERO tangible information on the Anderson Ranch plans), and roughly 10 voicemails to, apparently, the only person who may have anything more than a random guess about what might happen to the Anderson Ranch transaction (her name is Pamela Herrera-Olivas and her outgoing voicemail message is a year old, so, well, she may not even exist for all I know) and who couldn't even bother to return any of my phone calls, I am left to assume the worst. And that is that this absolutely horrible "deal" that the American people and the countless other forms of life that have been killed, maimed or never even had a chance to be born are getting is because the Department of the Interior is going to drill and otherwise further devastate New Mexico, as it does all over the country. This link refers to the geologic characteristics of the Anderson Ranch, and about all the oil located on the site: <http://geophysics.geoscienceworld.org/content/22/4/870.short?related-urls=yes&legid=gsgpy:22/4/870>.

Whilst I am essentially operating in a vacuum, when no one will talk to me about what is going to transpire after the ink is dry on this "deal," and when there is no recourse, except the one person who won't talk to me, I am left to assume the worst, which is all I've ever seen from the Department of the Interior. Why else would the US government have Chevron hand over what is essentially chump change under their CEO's couch cushions (\$4 million dollars) to make amends for their reckless polluting of an entire region? This clean up will eventually cost someone (but not Chevron) nearly a billion dollars (<http://schatziearthproject.com/2014/11/25/taos-new->

mexico-article-about-chevron-mine/). And then, also in your Consent Decree, DOJ makes Chevron promise not to have any future claims or ownership regarding the Anderson Ranch property (<http://schatziearthproject.com/2014/11/25/excerpted-sections-of-us-dept-of-justice-vs-chevron-for-new-mexico-pollution-site-at-questa-mine/>)...hmmm.

Well, I smell a rat, frankly. I'm sorry to give the Department of Justice such a hard time. I think that you must have to do the most expeditious thing possible. As someone from the USGS said to me on the phone regarding this case, "Well, it could be worse. it's been going on for years and at least we got them to stop operating this mine. Usually, they will shut this stuff down when it's not profitable and then just reopen it and keep going when it's worth the pay off, and we are left with a worse mess. Even though they (New Mexico) lost all those jobs, at least the people who lost those jobs can now get a job cleaning up the mess once this is done." Shit. Why don't we just get prisoners to do this horrible work? I suggest that the Chevron executives that perpetuate this situation roll up their Hermes shirt sleeves and do it themselves. On their way to jail. Otherwise, this is going to go on ad infinitum. Or until we become extinct. Whichever comes first, and it's going to be a photo finish.

And I've never even been to New Mexico. I will never be able to recoup the hours I spent figuring this out, but it was worth it because I am, more importantly, a citizen of planet earth. A place that the fossil fuel industry is killing. DOJ, please, please stand up for all of us who can speak up for what is right, and for all those who have no voice whatsoever.

Sincerely,
Schatzie

EXHIBIT C

to

**Plaintiffs' Memorandum in Support of
Motion to Enter Consent Decree**

**U.S. and New Mexico v. Chevron Mining, Inc.,
No. 1:14-cv-783, D.N.M.**

Letter of Defendant Chevron Mining, dated October 3, 2014



David W. Partridge
President and CEO

Chevron Mining Inc.
116 Inverness Drive East
Suite 207
Englewood, CO 80112
303-930-4065
dpartridge@chevron.com

October 3, 2014

pubcomment-ees.enrd@usdoj.gov

Assistant Attorney General, U.S. DOJ-ENRD
P.O. Box 7611
Washington, DC 20044-7611

Re: Notice of Lodging of Proposed Consent Decree in *United States and State of New Mexico v. Chevron Mining Inc.*, District of New Mexico Civil Action No. 14cv783 KBM-SCY

Dear Sir or Madam:

I am the President of Chevron Mining Inc. ("Chevron"). Chevron is the settling defendant in the above-referenced proposed Consent Decree. Chevron hereby confirms that: it admits to no liability for matters addressed in the decree; it has agreed to the terms of the decree as a result of arms-length, good faith negotiations with the public resource trustees who are the plaintiffs in this action; and it intends to fully carry out its obligations under the decree.

The consent decree negotiations were lengthy and the issues were thoroughly discussed by all parties. The negotiations began 13 years ago (in 2001), while Molycorp, Inc. owned the Questa mine, now owned by Chevron. The federal government was represented by the Bureau of Land Management and the U. S. Fish and Wildlife Service (Department of the Interior) and the U.S. Forest Service (Department of Agriculture). The State of New Mexico was represented by its Office of the Natural Resource Trustee. These government entities, in addition to using their own scientific experts, hired the expert consulting services of Stratus Consulting, Inc. for additional scientific and technical analysis and advice. Over the course of the negotiations, Chevron paid \$3.4 million to compensate the government trustees and their consultants for their natural resource damage assessment activities and negotiation costs. Chevron also employed outside experts.

The alternative to settlement would have been lengthy and expensive litigation that would have inevitably required the expenditure of very substantial resources by both sides. Avoiding such costs is to everyone's benefit. Moreover, litigation would delay the availability of funds to

pubcomment-ees.enrd@usdoj.gov
Assistant Attorney General, U.S. DOJ-ENRD
October 3, 2014
Page 2

be invested in restoration projects. Chevron believes that the proposed decree is a fair and reasonable resolution of this dispute, and that its entry would benefit not only all parties to the decree, but also the general public. The natural resource restoration projects funded through the decree will provide significant benefits to the environment near Questa, New Mexico, and to those who wish to enjoy it.

For the foregoing reasons, Chevron will support a motion by the Department of Justice for entry of this decree by the Court.

Respectfully submitted,



David W. Partridge
President & CEO, Chevron Mining Inc.

cc: Eve W. Barron, Esq.
Richard E. Schwartz, Esq.
Thomas A. Mariani, Esq.

EXHIBIT D

to

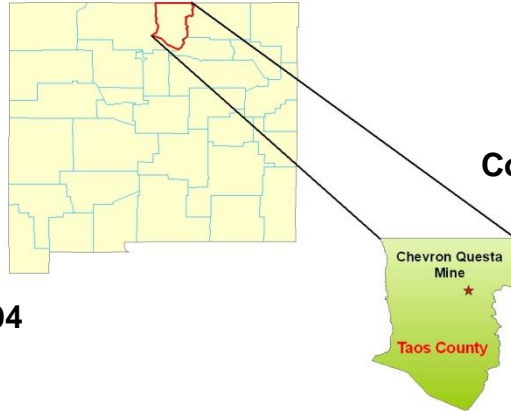
**Plaintiffs' Memorandum in Support of
Motion to Enter Consent Decree**

**U.S. and New Mexico v. Chevron Mining, Inc.,
No. 1:14-cv-783, D.N.M.**

U.S EPA, Chevron Questa Mine Site Summary, July 2015

CHEVRON QUESTA MINE

(Formerly Molycorp)

**(TAOS COUNTY)
NEW MEXICO****EPA ID# NMD002899094
Site ID: 0600806****EPA REGION 6****U.S. CONGRESSIONAL
DISTRICT 03****Contact: Gary Baumgarten
214-665-6749****Laura Stankosky
214-665-7525****Updated: July 2015****Current Status**

EPA, the State of New Mexico (State) and Chevron Mining Inc. (CMI) entered into negotiations for CMI to conduct early actions at the Site. On March 7, 2012, EPA and CMI reached an agreement (Administrative Order on Consent or AOC) for CMI to perform removal actions at the Site beginning in 2012. The removal actions will consist of (1) removal of PCB-contaminated soil at the Mill Area with off-Site treatment/disposal, (2) removal of historic tailing spill deposits along the Red River riparian corridor, (3) removal of contaminated sediment at Eagle Rock Lake and installation of a storm-water control structure for the lake inlet, and (4) the piping of unused irrigation water within the eastern diversion channel adjacent to the tailing facility.

Field work began in June 2012 with a pre-construction meeting and health and safety meeting. Removal of PCB-contaminated soil in the mill area began in July 2012, and was completed in October 2012. Installation of the storm-water control structure for Eagle Rock Lake inlet began October 29, 2012, and was completed in December 2012. Cleanup of historic tailing spills at the Lower Dump Sump started February 11, 2013, and was completed in August 2013. Cleanup of tailing spills along the former tailings pipeline adjacent to State Highway 38 started September 2013, and was completed in September 2014. Work to pipe unused irrigation water within the eastern diversion channel adjacent to the tailing facility began in October 2013 and was completed in September 2014. Work to remove contaminated sediment at Eagle Rock Lake began on January 12, 2015. The sediment excavation at Eagle Rock Lake is nearing completion; excavation should be complete mid-May 2015. Sand and liner placement will be placed Summer 2015.



On September 25, 2012, another AOC was signed which set forth early design actions that CMI will conduct at the Site. The early design work involves additional ground water investigation at the tailing facility, design support investigations for ground water extraction wells and expanded seepage collection systems, characterization of Spring Gulch waste pile borrow material, a waste rock pile pilot project, a slope stability analysis for the waste rock piles and treatability studies for water treatment.

The Pre-Design Borrow Characterization of Spring Gulch Waste Rock and Toxicity Review Work Plan was approved in August 2013. Field work at Spring Gulch began in August 2013 and concluded in September 2013. The field work at Spring Gulch included excavation and sampling of test pits and drilling and sampling of boreholes. CMI submitted a report in April 2014 documenting the field work and findings.

The draft report was approved by EPA on December 1, 2014. The water treatability studies began in September 2013 and work concluded in spring 2014. CMI submitted a report to document the results of the water treatability studies to EPA on August 29, 2014. Following submission of comments by EPA on the water treatability study report in December 2014, CMI submitted a revised report to EPA in December 2014. CMI is currently conducting the drilling program at the tailing facility to further evaluate ground water.

As required under the September 2012 AOC, CMI initiated the multi-stakeholder facilitated process to develop and evaluate remedial design options for the waste rock piles. CMI set up a technical working group (TWG) in which experts retained by EPA, NMED, MMD, and other stakeholders were invited to participate. The TWG will provide technical expertise to assist CMI in the development and evaluation of design options for the waste rock piles. The TWG will provide input relating to EPA's Selected Remedy as well as the regulatory requirements and Performance Standards set forth in the ROD. The TWG will provide factual findings from that process to CMI for consideration in preparing deliverables for EPA review. The TWG has met on the following dates: January 23-24, 2013; March 7-8, 2013; April 1-3, 2013; May 8-9, 2013; July 23-25, 2013; August 28-29, 2013; November 19-21, 2013; January 22-24, 2014; March 11-13, 2014; April 30 – May 2, 2014; June 9-11, 2014, July 30-August 1, 2014, September 3-5, 2014, October 22-23, 2014, January 20-21, 2015.

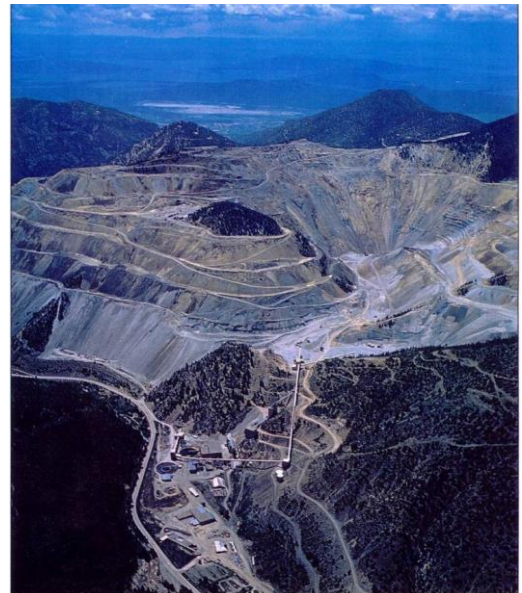
On September 30, 2014, a first amendment to the Early Design AOC was signed which set forth additional early design actions that CMI will conduct at the Site. The additional work to be conducted under the first amendment includes: 1) Design of a Ground Water Extraction System in the Lower Sulphur Gulch Waste Rock Pile Drainage; 2) Design of a Groundwater Extraction Systems to Enhance Lower 002 Seepage Barrier and Upper 003 Seepage Barrier at Tailing Facility; and 3) Design and Construction of Pilot Surface Based Mine Dewatering System.

On November 13, 2014, a second amendment to the Early Design AOC was signed which set forth additional early design actions that CMI will conduct at the Site. The additional work to be conducted under the second amendment includes: 1) Preparation of a Tailing Facility Grading Plan; and 2) conduct field trials of Spring Gulch waste rock cover material.

Background

The Chevron Questa Mine site (Site), formerly Molycorp, Inc., is located in and near the village of Questa, Taos County, New Mexico. The Site includes a former molybdenum mine and milling facility located on three square miles of land and tailing ponds located on approximately one and a half square miles of land, which are currently owned by CMI. A nine-mile long pipeline running along State Highway 38 connects the milling facility to the tailings ponds. Mining operations at the site began at the mine in 1920. Open pit mining was conducted from 1965 to 1983 and resulted in over 328 million tons of acid-generating waste rock being placed into nine piles surrounding the open pit. Over 100 million tons of tailing have been disposed at the tailing ponds.

EPA re-proposed the Molycorp, Inc. site to the National Priorities List (NPL) of Superfund Sites in March 2011. The site was placed on the NPL on September 16, 2011. As part of the listing, EPA changed the name of the site to the Chevron Questa Mine Superfund site based on comments received during the public comment period. EPA selected the remedy in a December 20, 2010 Record of Decision (ROD).



Benefits

The selected remedy outlined in the ROD will allow EPA to mitigate threats to public health and the environment from the release or potential release of hazardous substances, pollutants, and contaminants at or from the Site.

National Priorities Listing (NPL) History

Site Hazard Ranking System Score: 50

Proposed Date: May 11, 2000

Re-proposed Date: March 10, 2011

Final Date: September 16, 2011

Site Description

Location: The Site is located 4 miles east of Questa, Taos County, New Mexico. The tailings ponds are located 1 mile west of Questa.

Population: An estimated 1,100 people live within a mile of the tailings ponds. There are no people currently living within one mile of the mine site.

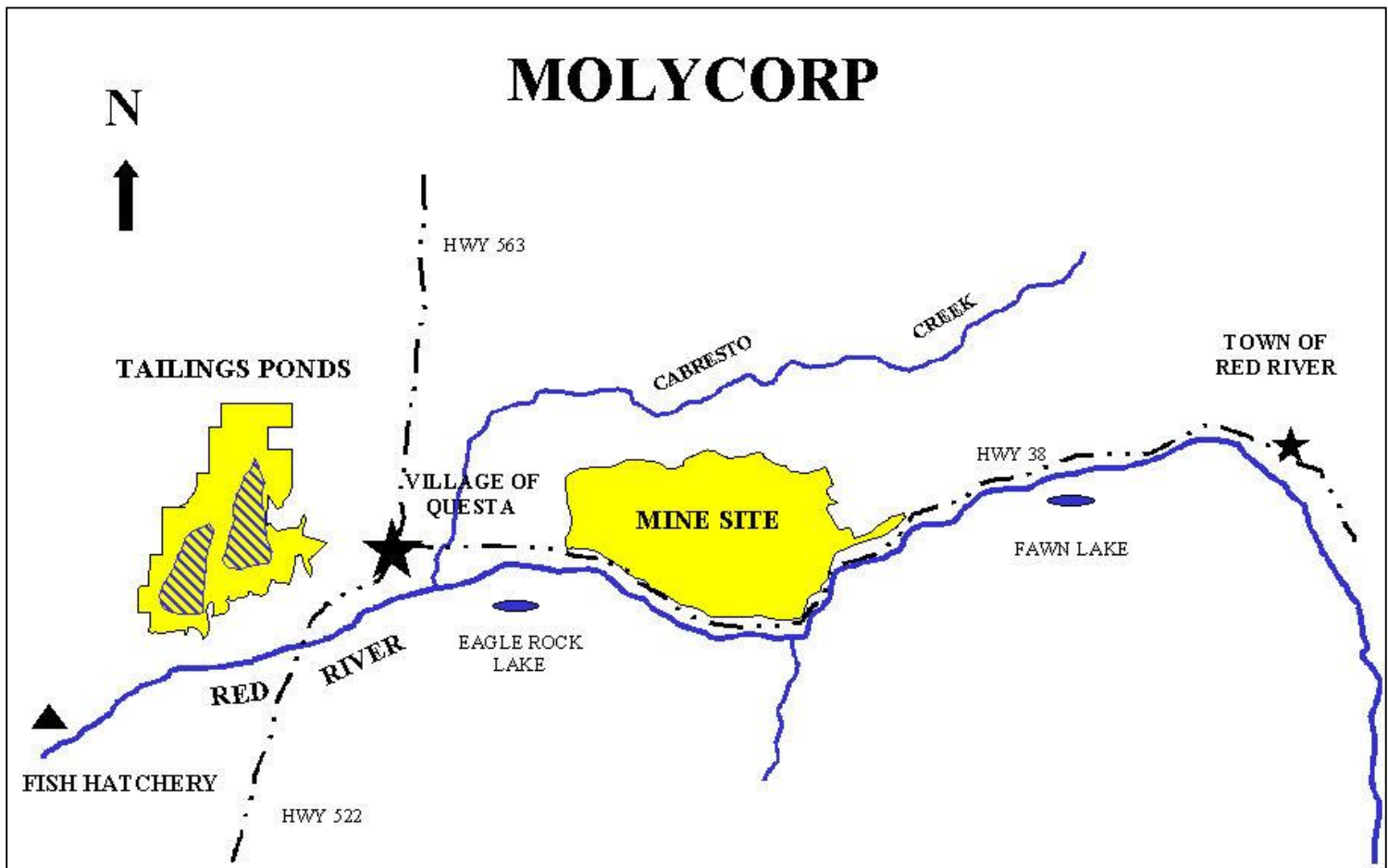
Setting: The mine site and milling facility are located in the Sangre de Cristo Mountains and the tailing facility is located in the Rio Grande rift basin. The mine and tailings ponds are bounded to the south by the Red River, a tributary of the Rio Grande. The Red River is home to a State fish hatchery located 2 miles downstream of the tailings ponds and is designated as a Wild and Scenic River in the vicinity of its confluence with the Rio Grande. Over the years numerous breaks in the pipeline resulted in the spilling of tailings into and along the flood plain of the Red River, threatening the fishery and nearby endangered species habitats. Tailing seepage from the tailings ponds and acidic metal-laden leachate generated from the weathering of the waste rock piles (referred to as acid rock drainage or ARD) at the mine site has contaminated ground water and surface water. Past operating practices at the tailing facility has resulted in adjacent surface soil being contaminated with molybdenum. A small lake, known locally as Eagle Rock Lake, is located along the Red River riparian corridor and receives its water from the river through an inlet gate. Sediments in Eagle Rock Lake are contaminated with heavy metals.

Hydrogeology: Mine Site — Contaminated ground water within side drainage basins flow into the Red River alluvial aquifer. Some of the ground water within the alluvial aquifer flows into the Red River as seeps and springs at zones of upwelling. Acidic, metal laden seepage at the toe of the Capulin and Goat Hill North rock piles is captured and directed to the underground mine workings. The dewatering of the underground mine workings has created a zone of capture for the deep bedrock ground water. Molycorp uses water collected from the underground workings and the alluvial aquifer (via pumping wells) for production water in its milling operations.

Tailings Ponds — Ground water is present beneath the tailings ponds in an upper alluvial aquifer and a basal volcanic aquifer. Saturation of the tailings has created a partial mounding of ground water beneath the ponds. Seepage from the tailings ponds has moved both downward into the underlying aquifers and laterally to ground surface as seeps. Seepage-impacted water is extracted by collection systems and discharged to the Red River via a permitted outfall (002 Outfall).

Principal Pollutants: Heavy metals, including aluminum, arsenic, cadmium, chromium, cobalt, fluoride, lead, manganese, molybdenum, sulfate and zinc.

Site Map



Record of Decision

Signed: December 20, 2010

Remedy Selected:

Mill Area – Excavate PCB-contaminated soil and dispose at off-site treatment/disposal facility, cover with 3 feet of amended, non-acid generating waste rock in areas designated for forestry and revegetate;

Mine Site Area – Source containment by regrade of waste rock piles to slopes ranging between 3 horizontal to 1 vertical and 2 horizontal to 1 vertical interbench slopes, with partial/complete removal of waste rock to accommodate slope requirement, cover with 3 feet of amended, non-acid generating waste rock and revegetate; operate seepage interception and ground water extraction systems, dewater underground mine, treat water, provide temporary alternate water supply if necessary, and temporary well drilling restrictions;

Tailing Facility Area – Source containment by regrade, cover, and revegetation of tailing impoundments, upgrade of existing seepage collection (drains and wells), piping of irrigation water in eastern diversion channel, ground water extraction and water treatment, control access to site by physical barriers, including exclusion fence to restrict access by deer and elk, provide wildlife drinkers, provide temporary alternate water supply if necessary, and temporary well drilling restrictions;

Red River, Riparian, and South of Tailing Facility Area – Remove molybdenum-contaminated soil and tailing spill deposits and on-site disposal;

Eagle Rock Lake – Inlet storm water controls, dredge sediment and on-site disposal.

Contacts

EPA Remedial Project Managers:	Gary Baumgarten	214.665.6749
	Laura Stankosky	214.665.7525
EPA Community Involvement Coordinator:	Janetta Coats	214.665.7308
EPA Attorney:	Elizabeth Pletan	214.665.8525
EPA Region Public Liaison	Donn R. Walters	214.665.6483
New Mexico Environment Department:	Joe Fox	505.222.9560
EPA Region 6 Superfund Toll Free Number:		800.533.3508