NOTICES OF PUBLIC INFORMATION

Notices of Public Information contain corrections that agencies wish to make to their notices of rulemaking; miscellaneous rulemaking information that does not fit into any other category of notice; and other types of information required by statute to be published in the *Register*. Because of the variety of material that is contained in a Notice of Public Information, the Office of the Secretary of State has not established a specific format for these notices.

NOTICE OF PUBLIC INFORMATION

DEPARTMENT OF ENVIRONMENTAL QUALITY

1. **A.R.S. Title and its heading:** 49, The Environment
A.R.S. Chapter and its heading: 2, Water Quality Control
A.R.S. Article and its heading: 2.1. Total Maximum Daily Loads
Section: A.R.S. § 49-234—Total maximum daily loads; implementation plans

2. **The public information relating to the listed statute:**

Pursuant to A.R.S. § 49-234, the Arizona Department of Environmental Quality (Department) is required to develop a total maximum daily load (TMDL) for navigable waters that are listed as impaired. The purpose of this Notice is to publish the Department's determinations of total pollutant loadings for TMDLs in the **Alum Gulch, Harshaw Creek, and Three-R Canyon** Watersheds that the Department intends to submit to the Regional Administrator for Region 9, U.S. Environmental Protection Agency ("EPA") for approval.

The Department previously provided public notice and an opportunity for public comment on the Draft reports in *The Nogales International* and the *Arizona Daily Star*, newspapers of general circulation in the affected area as detailed below:

"Proposal of a Total Maximum Daily Load For Upper **Alum Gulch** for Cadmium, Copper, Zinc and Acidity" and "Proposal of a Total Maximum Daily Load For Upper **Harshaw Creek** for Copper and Acidity" on January 17, 2003.

"Proposal of a Total Maximum Daily Load For **Three-R (3R) Canyon** for Beryllium, Cadmium, Copper, Zinc and Acidity" on February 10, 2003.

The Department received written comments from Asarco, Inc.; James K. "Buck" Clark; Randy Heiss; Elizabeth Morton; Santa Cruz Natural Resource Conservation District; U.S. Environmental Protection Agency; state of Arizona Game and Fish Department; and the U.S. Forest Service on the TMDLs during the public notice period. The Department has included a summary of the comments and the Department's responses, in this notice. The purpose of this notice is to satisfy A.R.S. § 49-234(D), which require the Department to publish in the Arizona Administrative Register, the determination of total pollutant loadings that will not result in impairment and the proposed allocations among the contributing sources that are sufficient to achieve the total pollutant loadings.

3. **Total Maximum Daily Loads (TMDLs)**

A. Total Maximum Daily Load (TMDL) Process

A Total Maximum Daily Load (TMDL) represents the total load of a pollutant that can be discharged to a water body on a daily basis and still meet the applicable water quality standard. The TMDL can be expressed as the total mass or quantity of a pollutant that can enter the water body within a unit of time. In most cases, the TMDL determines the allowable pounds per day of a pollutant and divides it among the various contributors in the watershed as wasteload (i.e., point source discharge) and load (i.e., nonpoint source) allocations. The TMDL must also account for natural background sources and provide a margin of safety. For nonpoint sources such as accelerated erosion or internal nutrient cycling, it may not be feasible or useful to derive a pounds per day figure. In such cases, a percent reduction in pollutant loading may be proposed. A load analysis may take the form of a phased TMDL, if source reduction or remediation can be better accomplished through an iterative approach.

In Arizona, as in other states, changes in standards or the establishment of site-specific standards are the result of ongoing science-based investigations or changes in toxicity criteria from EPA. Changes in designated uses and standards are part of the surface water standards triennial review process and are subject to public review. Standards are not changed simply to bring the water body into compliance, but are based on existing uses and natural conditions. These TMDLs meet or exceed the following EPA Region 9 criteria for approval:

Specific plan to meet state surface water quality standards: The TMDLs include a study and a plan for the specific pollutants that must be addressed to ensure that applicable water quality standards are attained.

Describe quantified water quality goals, targets, or endpoints: The TMDL must establish numeric endpoints for the water quality standards, including beneficial uses to be protected, as a result of implementing the TMDLs. This often requires an interpretation that clearly describes the linkage(s) between factors impacting water quality standards.

Analyze/account for all sources of pollutants: All significant pollutant sources are described, including the magnitude and location of sources.

Identify pollution reduction goals: The TMDL plan includes pollutant reduction targets for all point and nonpoint sources of pollution.

Describe the linkage between water quality endpoints and pollutants of concern: The TMDLs must explain the relationship between the numeric targets and the pollutants of concern. That is, evidence that the recommended pollutant load allocations will not exceed the loading capacity of the receiving water.

Develop margin of safety that considers uncertainties, seasonal variations, and critical conditions: The TMDLs must describe how any uncertainties regarding the ability of the plan to meet water quality standards that have been addressed. The plan must consider these issues in its recommended pollution reduction targets.

Provide implementation recommendations for pollutant reduction actions and a monitoring plan: The TMDLs should provide a specific process and schedule for achieving pollutant reduction targets. As applicable, monitoring plan should also be included, especially where management actions will be phased in over time and to assess the validity of the pollutant reduction goals.

Include an appropriate level of public involvement in the TMDL process: This is usually met by publishing public notice of the TMDLs in a newspaper of general circulation in the area affected by the study, circulating the TMDLs for public comment, and holding public meetings in local communities. Public involvement must be documented in the state's TMDL submittal to EPA Region 9.

In addition, these TMDLs comply with the public notification requirements of A.R.S. Title 49, Chapter 2, Article 2.1. Publication of these TMDLs in the *Arizona Administrative Register* is required per Arizona Revised Statutes, Title 49, Chapter 2, Article 2.1 prior to submission of the TMDL to EPA. The Department shall:

1. Prepare a draft estimate of the total amount of each pollutant that causes impairment from all sources that may be added to a navigable water while still allowing the navigable water to achieve and maintain applicable surface water quality standards, and make reasonable and equitable allocations among the TMDLs sources, and provide public notice and an opportunity for comment in a newspaper of general circulation in the affected area;
2. Publish a notice in the *Arizona Administrative Register* (this Notice) of the determination of total pollutant loadings that will not result in impairment, and the reasonable and equitable allocations among the TMDL sources. A summary of comments received to the initial TMDL public notice, and the Department's responses to the comments.

Current federal law only requires the submittal of the pollutant loadings to EPA for approval. However, the Department considers the pollutant loadings and the draft allocations to be integrally related and should be presented together to afford the public a complete understanding of the issues, outcomes and recommendations of the TMDL analysis. For that reason, the Department has combined the loadings and allocations in both the public notice in the local newspaper as well as in this publication in the *Arizona Administrative Register.*

Project Summaries

Because of the proximity of the three streams to one another and the similarities in stressors affecting each, ADEQ decided to conduct investigations of the three 303[d]-listed stream segments in the Sonoita Basin simultaneously. These streams are: Alum Gulch, Harshaw Creek, and Three R Canyon. The subject basins are in Santa Cruz County, Arizona. The closest town is Patagonia, Arizona. The approximate center of the three basins is, latitude: 31° 29' N, longitude: 110° 44' W. Basin elevations range from 6,600 ft. to 4,000 ft.

The early data used to determine impairment which resulted in the 303[d] listing was collected during the 1980s and 1990s in support of the goals of other ADEQ programs and is insufficient to isolate sources or calculate loads. ADEQ collected data starting in 1997 and continuing through 2000 specific to the goals of source quantification and TMDL calculation. Designated uses and specific water quality standards for these streams and parameters are listed in Title 18, Chapter 11 of the *Arizona Administrative Code.*

In 2000, ADEQ hired Hydro Geo Chem (HGC) of Tucson, AZ to review available data, select an appropriate model, and conduct flow and load modeling for the listed segments. HGC used ADEQ field measurements to support modeling. The first draft of this TMDL investigation was released for public review in December 2001 and received considerable public comment.

In the spring of 2002, the U.S. Geological Survey (USGS) completed a six year long study in the Sonoita Basin and made available to ADEQ staff all monitoring data and findings which would be considered pertinent to the TMDL investigation. ADEQ then tasked HGC with reviewing the additional information and updating the model as necessary. HGC determined that the USGS data supported and enhanced ADEQ's understanding of pollutant sources and critical conditions; however, the USGS data did not offer new flow related events that could be used in the model.

The November 2002, USEPA approved ADEQ's 2002 triennial review changes to the surface water quality standards. The TMDLs were recalculated using the new standards and revised designated uses for several of the listed segments. The current drafts of the reports incorporate the additional data and changes to Arizona's water quality standards.

Alum Gulch

The listed reach of Alum Gulch runs about two miles from its headwaters to a point approximately 1/4 mile downstream from the World's Fair Mine and includes the entire length of its primary tributary, Humboldt Canyon. The

listed reach drains approximately 1900 acres and is listed for impairments due to dissolved and total cadmium, copper, zinc, and acidity (pH). The remainder of Alum Gulch, starting at the downstream end of the study reach and continuing approximately 4 1/2 miles to its mouth on Sonoita Creek, is not included on the 303[d] List and, therefore, not addressed in this TMDL.

The listed portion of Alum Gulch basin is almost wholly contained within the Coronado National Forest and is available for recreational usage and limited cattle grazing. Alum Gulch has two privately-owned inactive mines: the Trench Camp Mine and the January Adit, both are owned by Asarco.

Harshaw Creek

The listed reach of Harshaw Creek runs about 3 1/2 miles from its headwaters to a point approximately 50 ft. downstream from a perennial spring near the Trench Camp Mine site. The primary tributary to the listed portion of Harshaw Creek is an unnamed canyon containing the Endless Chain Mine and an undisturbed basin that provides natural background measurements. The listed reach drains approximately 2,300 acres.

The segment was listed for impairments due to dissolved and total copper, zinc, and acidity (pH). As a result of the changes to the Arizona surface water quality standards during the 2002 triennial review, and because human-caused exceedences were not observed nor noted during modeling, ADEQ will not calculate a TMDL for zinc at this time, but will keep zinc on the list of parameters to be monitored. Copper measurements also only exceeded the new water quality standards at the natural background sampling point; however, modeling indicates exceedences will occur at higher discharges. Therefore, ADEQ has calculated a TMDL and load allocations for copper on the subject reach.

The remainder of Harshaw Creek, starting at the downstream end of the study reach and continuing approximately 11 1/2 miles to its mouth on Sonoita Creek, is not included on the 303[d] List and, therefore, not addressed in this TMDL.

The Harshaw Creek basin is almost wholly contained within the Coronado National Forest and is available for recreational usage and limited cattle grazing. The basin contains one privately owned mine, the Trench Camp Mine, owned by Asarco. There is some privately owned land occupied by ranches, farms and vacation cabins/homes downstream from the study area.

Three-R Canyon (3R Canyon)

The listed reach of 3R Canyon runs about five miles from its headwaters to the mouth of Cox Gulch. The primary tributary to the listed portion of 3R Canyon is the approximately two mile long Cox Gulch and an unnamed canyon (containing the European Mine) tributary to Cox Gulch. The listed reach drains approximately 1,770 acres. This segment was listed for impairments due to beryllium, copper, zinc, and acidity (low pH). As a result of monitoring for this study, it was found that the streams also were impaired for cadmium. The remainder of 3R Canyon, starting at the downstream end of the study reach and continuing approximately three miles to its mouth on Sonoita Creek, is not included on the 303[d] List and, therefore, not addressed in this TMDL.

The subject basin is almost wholly contained within the Coronado National Forest and is available for recreational usage and limited cattle grazing. The basin contains one privately owned mine, the 3R Mine, owned by James “Buck” Clark. There is some privately owned land occupied by the Circle Z ranch downstream from the study area.

Pollutant Sources

Natural background sources: “A field inspection verified that there are large portions of the subject watersheds containing naturally occurring disseminated pyrite and iron oxides due to weathering of pyrite.” (HGC)

Evidence of mining activities in the basin above the 3R Mine (3R Canyon/Cox Gulch), above the Endless Chain Mine (Harshaw Creek) and above the Thunder Mine (Humboldt Canyon/Alum Gulch) is very limited and runoff from these areas is considered natural background for purposes of this project.

Adit Drainage

The adit drainage in the study area is usually very acidic, pH of 2 to 3, and carries a variety of metals.

The January Adit and World’s Fair Mine have the only observed constant drainage in the listed portion of the Alum Gulch basin. The January Adit does not discharge directly to the stream, but rather to a constructed wetlands. The discharge both evaporates from the wetlands or infiltrates; a portion of the infiltration then discharges to the stream from a nearby seep. There are one or more springs beneath the World’s Fair Mine which are a major source of acidity and metals. (USGS)

No drainage was observed from any of the mines in the listed portion of the Harshaw Creek basin.

Adit drainage was observed at two mines in the 3R Canyon basin:

The 3R Mine was observed on occasion to have a very low discharge that did not flow for more than 10 meters before disappearing into the alluvium.

One adit of the Ventura Mine group has a continuous discharge that did not flow for more than 10 meters in the Cox Gulch stream channel before disappearing into the alluvium.

It does not appear that adit drainage constitutes a major source of pollutant loading in the subject basin.

Mining Residues

In addition to adit drainage, mining residues are a significant source of pollutants and consist of three major categories of material:

Waste rock removed to gain access to the ore. (This material may or may not have leachable metals.)

Low grade ore waste that has leachable metals in quantities that were uneconomical to extract at the time of mining.

Mill tailings which are the finely ground waste after separation from the economically useful minerals. This material may or may not have leachable metals.

These materials are sometimes mixed (layered) in the same "dumps," dependent upon mine or mill activities at the time of dumping. The dumps are exposed to precipitation and are being slowly eroded and fed into the stream by runoff. Those piles in contact with the stream are being constantly eroded and undercut creating a potential for collapse into the stream.

The mine sites of the watershed typically include numerous adits and shafts, waste rock, and relic tailings dumps, and the larger sites typically have the remains of mills or other ore-handling fixtures, all resting on the steep, rocky banks of the stream. These sites release concentrations of metals in the "high metal" (high concentrations) category relative to a large range of mine types compiled from world literature. (USGS)

Streambed Sediments

Streambed sediments result from the wasting of mining residue piles, natural erosion and evaporative deposits from groundwater discharges. Findings from the USGS investigation suggest that streambed sediments are the primary source of pollutant loading throughout the subject basins.

Discrete Sources

The listed portions of the subject waterbodies are narrow steep-walled canyons with limited horizontal space available to support mining activity, yet there are many small mines throughout the basins which have a potential impact.

The major portion of the loading to Alum Gulch originates from the World's Fair Mine site and Humboldt Canyon with relatively minor contributions from Trench Camp Mine and the January Adit. The Trench Camp mining residue material dumps numbers 1, 2, and 4 fill the upper portion of Alum Gulch, and dump No. 3 is in the Harshaw Creek basin. It appears that the remediation efforts at Trench Camp and the January Adit have been fairly successful.

Humboldt Canyon contains many small prospect pits, small adit or shaft mines and the Humboldt Mine, a cluster of shafts and adits with waste piles large enough to occupy part of the stream channel. The density of mining activities precludes differentiating between individual mines as sources.

The waste piles of the Morning Glory Mine occupy a portion of the channel at the headwaters of Harshaw Creek. This is a potentially major source due to the large volume of waste material and the prevalence of visible pyrite exposed at the surface

The Endless Chain Mine, located in a tributary of Harshaw Creek near its headwaters, is considered a significant source of pollutant loading and includes a waste pile occupying a portion of the stream channel.

The spring near the downstream end of the listed reach of Harshaw Creek has the only observed source of constant drainage in the subject basin. The spring is not considered a major source of pollutant loading.

The majority of the pollutant loads to 3R Canyon/Cox Gulch are contributed by the springs (one in 3R Canyon, the other in Cox Gulch) with a slightly lower load contribution from both the 3R Mine and natural background.

LOADING TABLES - Units are kilograms/day.

Alum Gulch Loading Table A Trench Camp Mine runoff (point source) Sample point: SCALG005.90
Bankfull discharge = 8.7 cfs No natural background load applicable at this sample point.

Parameter	MOS	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.3	0.21	N/A	0.21	0.51
Cd (total)	0.21	0.21	N/A	0.21	0.42
Cu (diss)	0.11	0.28	N/A	0.28	0.39
Cu (total)	2.1	1.3	N/A	1.3	3.4
Zn (diss)	5.1	53	N/A	21	26
Zn (total)	106	62	N/A	62	168
H+ (pH)	1.40e-06	1.60e-05	N/A	5.40e-06	6.80e-06

Alum Gulch Loading Table B January Adit (point source) Sample point: SCALG005.58
Baseflow discharge = 0.04 cfs No natural background load applicable at this sample point at this discharge.

Parameter	MOS	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.00012	0.014	N/A	0.00049	0.00061
Cd (total)	0.00098	0.016	N/A	0.0039	0.0049
Cu (diss)	0.00057	0.011	N/A	0.0023	0.0029
Cu (total)	0.0098	0.011	N/A	0.011	0.021
Zn (diss)	0.0074	4.6	N/A	0.03	0.037
Zn (total)	0.49	4.8	N/A	2	2.4
H+ (pH)	6.20e-09	2.00e-06	N/A	2.50e-08	3.10e-08

Alum Gulch Loading Table C Basin containing the January Adit and Trench Camp Mine (non-point source).
Sample point: SCALG005.58 Bankfull discharge = 12.6 cfs. No H+ natural background available.

Parame-ter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.032	0.0043	0.64	0.12	N/A	0.16
Cd (total)	0.31	0.0043	0.74	0.74	N/A	1
Cu (diss)	0.15	0.15	3.3	0.43	N/A	0.73
Cu (total)	3.1	0.15	3.3	3.3	N/A	6.6
Zn (diss)	1.9	0.86	192	6.7	N/A	9.5
Zn (total)	154	0.86	191	191	N/A	346
H+ (pH)	2.00e-06	not avail.	3.70e-04	7.90e-06	N/A	9.90e-06

Alum Gulch Loading Table D Upper Humboldt Canyon (headwaters) (non-point source)
Sample point: SCHMC002.41 Bankfull discharge = 12.7 cfs
No natural background load available at this sample point.

Parame-ter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.4	not avail.	0.012	0.012	N/A	0.41
Cd (total)	4.3	not avail.	0.012	0.012	N/A	4.4
Cu (diss)	0.14	not avail.	7.4	0.58	N/A	0.72
Cu (total)	8.1	not avail.	7.3	7.3	N/A	15
Zn (diss)	6.9	not avail.	0.87	0.87	N/A	7.8
Zn (total)	2,610	not avail.	0.78	0.78	N/A	2,611
H+ (pH)	2.00e-06	not avail.	9.30e-03	8.00e-06	N/A	9.90e-06

Alum Gulch Loading Table E Upper Humboldt & un-named tributaries (non-point source)
Sample point: SCHMC001.27 Bankfull discharge = 38.6 cfs
No natural background load available at this sample point.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.27	not avail.	0.047	0.047	N/A	0.32
Cd (total)	13	not avail.	0.047	0.047	N/A	13
Cu (diss)	0.12	not avail.	5.9	0.48	N/A	0.59
Cu (total)	25	not avail.	6.4	6.4	N/A	31
Zn (diss)	6.5	not avail.	8	8	N/A	15
Zn (total)	7,933	not avail.	10	10	N/A	7,943
H+ (pH)	6.00e-06	not avail.	1.40e-02	2.40e-05	N/A	3.00e-05

Alum Gulch Loading Table F Basin containing the January Adit, Trench Camp Mine and Humboldt Canyon (non-point source). Sample point: SCALG005.30 Baseflow discharge = 0.06 cfs No natural background load applicable at this sample point at this discharge.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.00018	N/A	0.022	0.00073	N/A	0.00091
Cd (total)	0.0015	N/A	0.026	0.0059	N/A	0.0073
Cu (diss)	0.00086	N/A	0.18	0.0034	N/A	0.0043
Cu (total)	0.015	N/A	0.18	0.059	N/A	0.073
Zn (diss)	0.011	N/A	6.5	0.045	N/A	0.056
Zn (total)	0.73	N/A	6	2.9	N/A	3.7
H+ (pH)	9.40e-09	N/A	3.70e-05	3.80e-08	N/A	4.70e-08

Alum Gulch Loading Table G Basin containing the January Adit, Trench Camp Mine and Humboldt Canyon (non-point source). Sample point: SCALG005.30 Bankfull discharge = 68.5 cfs
No H+ natural background available.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.14	0.023	3.5	0.54	N/A	0.7
Cd (total)	1.7	0.023	4.7	4.7	N/A	6.4
Cu (diss)	0.62	0.84	88	1.6	N/A	3.1
Cu (total)	17	0.84	85	66	N/A	84
Zn (diss)	8	4.7	969	27	N/A	40
Zn (total)	838	4.7	868	868	N/A	1,711
H+ (pH)	1.10e-05	not avail.	2.50e-02	4.30e-05	N/A	5.40e-05

Alum Gulch Loading Table H Basin between SCALG005.30 and World's Fair (non-point source)
Sample point: SCALG004.98 Bankfull discharge = 74.8 cfs No H+ natural background available.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.14	0.026	4.2	0.52	N/A	0.69
Cd (total)	1.8	0.026	4.4	4.4	N/A	6.2
Cu (diss)	0.6	0.91	120	1.5	N/A	3
Cu (total)	18	0.91	108	72	N/A	91
Zn (diss)	7.7	5.1	1,106	26	N/A	39
Zn (total)	915	5.1	1,134	1,134	N/A	2,054
H+ (pH)	1.20e-05	not avail.	3.50e-02	4.70e-05	N/A	5.90e-05

Alum Gulch Loading Table I Worlds Fair Mine (point source) Sample point: SCALG004.82
Baseflow discharge = 0.01 cfs No natural background load applicable at this sample point at this discharge.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	3.04E-05	N/A	0.005	N/A	0.00012	0.00015
Cd (total)	0.00024	N/A	0.0045	N/A	0.00098	0.0012
Cu (diss)	0.00014	N/A	0.051	N/A	0.00057	0.00072
Cu (total)	0.0024	N/A	0.049	N/A	0.0098	0.012
Zn (diss)	0.0019	N/A	1.3	N/A	0.0074	0.0093
Zn (total)	0.12	N/A	1.3	N/A	0.49	0.61
H+ (pH)	1.60e-09	N/A	1.20e-05	N/A	6.00e-09	8.00e-09

Alum Gulch Loading Table J Worlds Fair Mine and surroundings (non-point source) Sample point: SCALG004.82
Bankfull discharge = 75.9 cfs No H+ natural background available.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.23	0.026	5.4	0.88	N/A	1.1
Cd (total)	1.9	0.026	5.2	5.2	N/A	7.1
Cu (diss)	1.1	0.93	171	3.3	N/A	5.3
Cu (total)	19	0.93	158	73	N/A	93
Zn (diss)	14	5.2	1,342	50	N/A	69
Zn (total)	928	5.2	1,240	1,240	N/A	2,173
H+ (pH)	1.20e-05	not avail.	5.90e-02	4.80e-05	N/A	5.90e-05

Alum Gulch Loading Table K Worlds Fair Mine and basin downstream (point source)
Sample point: SCALG004.61 Baseflow discharge = 0.19 cfs
No natural background load applicable at this sample point at this discharge.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.00058	N/A	0.1	N/A	0.0023	0.0029
Cd (total)	0.0046	N/A	0.13	N/A	0.019	0.023
Cu (diss)	0.0027	N/A	0.93	N/A	0.011	0.014
Cu (total)	0.046	N/A	0.98	N/A	0.19	0.23
Zn (diss)	0.035	N/A	25	N/A	0.14	0.18
Zn (total)	2.3	N/A	25	N/A	9.3	12
H+ (pH)	3.00e-08	N/A	3.00e-04	N/A	1.20e-07	1.50e-07

Alum Gulch Loading Table L Worlds Fair Mine and basin downstream (non-point source)
Sample point: SCALG004.61 Bankfull discharge = 93.2 cfs No H+ natural background available.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	Waste Load Allocation	TMDL
Cd (diss)	0.28	0.032	39	1.1	N/A	1.4
Cd (total)	2.3	0.032	39	9.1	N/A	11
Cu (diss)	1.3	1.1	250	4.2	N/A	6.7
Cu (total)	23	1.1	432	90	N/A	114
Zn (diss)	17	6.4	11,166	63	N/A	86
Zn (total)	1,140	6.4	10,254	4,554	N/A	5,700
H+ (pH)	1.50e-05	not avail.	8.70e-02	5.80e-05	N/A	7.30e-05

Harshaw Creek Load Table A Natural Background (non-point source)
Sample point: SCUHR000.56 Bankfull discharge = 8 cfs

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Cu (diss)	0.039	0.25	0	0	0.25
Cu (total)	2	0.014	0	0	2
H+ (pH)	1.30e-06	1.80e-05	0.00e+00	0.00e+00	1.80e-05

Harshaw Creek Load Table B Endless Chain Mine basin (non-point source)
Sample point: SCUHR000.38 Bankfull discharge = 13.5 cfs.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Cu (diss)	0.042	0.43	0	0	0.43
Cu (total)	3.3	0.023	0	0	3.3
H+ (pH)	2.10e-06	1.10e-08	0.00e+00	0.00e+00	2.10e-06

Harshaw Creek Load Table C Upper Harshaw basin (non-point source)
Sample point: SCHRC0013.63 Bankfull discharge = 27.1 cfs

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Cu (diss)	0.13	0.86	9.5	0	0.65
Cu (total)	6.6	0.046	0.58	0.58	7.3
H+ (pH)	4.20e-06	8.80e-07	0.00e+00	0.00e+00	5.10e-06

Harshaw Creek Load Table D Spring (non-point source)
Sample point: SCHRC0011.56. Baseflow discharge = 0.75 cfs.
No applicable natural background load at this sample point at this discharge.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Cu (diss)	0.032	0	0.02	0.02	0.052
Cu (total)	0.18	0	0.39	0.39	0.57
H+ (pH)	1.00e-07	0.00e+00	1.00e-09	1.00e-09	1.20e-07

Harshaw Creek Load Table E Middle Harshaw basin (non-point source)
Sample point: SCHRC0011.56 Bankfull discharge = 74.9 cfs

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Cu (diss)	3.2	2.4	4.6	4.6	10
Cu (total)	18	0.13	37	37	55
H+ (pH)	1.20e-05	1.80e-08	0.00e+00	0.00e+00	1.20e-05

3R Canyon Load Table A Natural Background (runoff) Sample point: SCUTH000.30
Bankfull discharge = 5.6 cfs

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Be (diss)	N/A	0.0015	N/A	N/A	N/A
Be (total)	7.7	0.0042	N/A	0.0042	7.7
Cd (diss)	0.039	0.003	N/A	0.003	0.042
Cd (total)	0.14	0.0044	N/A	0.0044	0.14
Cu (diss)	0.017	15	N/A	15	15
Cu (total)	1.4	16	N/A	16	16

Zn (diss)	0.94	0.19	N/A	0.19	1.1
Zn (total)	69	0.21	N/A	0.21	69
H+ (pH)	9.00e-07	3.70e-04	N/A	3.70e-03	3.70e-04

3R Canyon Load Table B Natural Background (runoff) Sample point: SCTHC004.50
Bankfull discharge = 4.0 cfs

Parameter	**MOS**	**Nat Back Load**	**Human-Caused Load**	**Load Allocation**	**TMDL**
Be (diss)	N/A	0.0011	N/A	N/A	N/A
Be (total)	5.5	0.0022	N/A	0.0022	5.5
Cd (diss)	0.028	0.0022	N/A	0.0022	0.03
Cd (total)	0.098	0.0031	N/A	0.0031	0.1
Cu (diss)	0.012	2.9	N/A	2.9	2.9
Cu (total)	0.98	3	N/A	3	4
Zn (diss)	0.67	0.29	N/A	0.29	0.97
Zn (total)	49	0.15	N/A	0.15	49
H+ (pH)	6.00e-07	3.40e-04	N/A	3.40e-04	3.40e-04

3R Canyon Load Table C 3R Mine plus natural background (runoff)
Sample point: SCTHC004.07 Bankfull discharge = 13.7 cfs

Parameter	**MOS**	**Nat Back Load**	**Human-Caused Load**	**Load Allocation**	**TMDL**
Be (diss)	N/A	0.0037	N/A	N/A	N/A
Be (total)	19	0.0037	0	0	19
Cd (diss)	0.096	0.00074	0.016	0.016	0.12

Cd (total)	0.34	0.011	0.026	0.026	0.37
Cu (diss)	0.042	24	167	0	0.21
Cu (total)	3.4	25	190	0	17
Zn (diss)	2.3	0.74	1.4	1.4	4.4
Zn (total)	168	0.5	1.4	1.4	169
H+ (pH)	2.10e-06	1.00e-03	8.00e-04	0.00e+00	1.10e-05

3R Canyon Load Table D 3R Spring (non-regulatable point source)
Sample point: SCTHC004.01 Baseflow discharge = 0.001 cfs
Note: Existing loads cannot be classified further as natural or human at this discharge.

Parameter	**MOS**	**Existing Load**	**TMDL**
Be (diss)	2.6E-06	5.4E-06	8E-06
Be (total)	0.00055	6.6E-06	5.6E-04
Cd (diss)	7E-07	1.6E-04	3.4E-06
Cd (total)	2.4E-05	1.4E-04	1.2E-04
Cu (diss)	2.5E-06	0.15	1.3E-05
Cu (total)	0.00024	0.14	1.2E-03
Zn (diss)	3.4E-05	3.8E-03	1.7E-04
Zn (total)	0.012	3.8E-03	1.6E-02
H+ (pH)	2E-10	2.7E-06	1E-09

3R Canyon Load Table E 3R spring plus upstream sources (runoff)
Sample point: SCTHC004.01 Bankfull discharge = 14.1 cfs

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Be (diss)	0.037	0.0038	0.027	0.027	0.067
Be (total)	7.8	0.0091	0.07	0.07	7.9
Cd (diss)	0.0075	0.0076	0.92	0	0.038
Cd (total)	0.34	0.011	1.3	1.3	1.6
Cu (diss)	0.027	24	1,620	0	0.14
Cu (total)	3.4	25	1,643	0	17
Zn (diss)	0.36	0.76	30	0	1.8
Zn (total)	172	0.52	32	32	205
H+ (pH)	2.20e-06	1.10e-03	5.80e-03	0.00e+00	1.10e-05

3R Canyon Load Table F Cox Gulch - Ventura Mine basin (nonpoint sources)
Sample point: SCCXG001.04 Bankfull discharge = 6.1 cfs
Note: No H+ measurement taken at this location.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Be (diss)	N/A	0.0016	N/A	N/A	N/A
Be (total)	8.4	0.004	0.057	0.057	8.4
Cd (diss)	0.23	0.0033	0.16	0.16	0.4
Cd (total)	0.15	0.005	0.32	0.32	0.48
Cu (diss)	0.082	11	17	0	0.41
Cu (total)	1.5	11	14	0	7.5
Zn (diss)	3.9	0.33	34	0	19

Zn (total)	75	0.22	34	34	109
H+ (pH)	1.00e-06	N/A	N/A	N/A	N/A

3R Canyon Load Table G Cox Gulch - European Mine basin (nonpoint sources)
Sample point: SCCXG000.01 Bankfull discharge = 10.8 cfs
Note: No H+ measurement taken at this location.

Parameter	**MOS**	**Nat Back Load**	**Human-Caused Load**	**Load Allocation**	**TMDL**
Be (diss)	N/A	0.0029	N/A	N/A	N/A
Be (total)	15	0.007	0.099	0.099	15
Cd (diss)	0.26	0.0058	0.15	0.15	0.42
Cd (total)	0.26	0.0085	0.19	0.19	0.47
Cu (diss)	0.097	19	28	0	0.49
Cu (total)	2.6	20	20	0	13
Zn (diss)	4.8	0.58	30	0	24
Zn (total)	132	0.4	24	24	156
H+ (pH)	1.70e-06	N/A	N/A	N/A	N/A

3R Canyon Load Table H Intermittent reach of Cox Gulch (point source)
Sample point: SCCXG000.85 Baseflow discharge = 0.001 cfs
Note: Existing loads cannot be further classified as natural or human at this discharge.

Parameter	**MOS**	**Existing Load**	**TMDL**
Be (diss)	2.6E-06	1.9E-05	1.3E-05
Be (total)	5.5E-04	2.4E-05	5.8E-04
Cd (diss)	3E-06	9.3E-05	1.5E-05

Cd (total)	2.4E-05	1.3E-04	1.2E-04
Cu (diss)	1.4E-05	3.2E-02	7.2E-05
Cu (total)	2.4E-04	3.3E-02	1.2E-03
Zn (diss)	1.9E-04	1.7E-02	9.3E-04
Zn (total)	1.2E-02	1.9E-02	3.1E-02
H+ (pH)	2.00e-10	1.20e-06	0.00e+00

3R Canyon Load Table I Intermittent reach of Cox Gulch (runoff)
Sample point: SCCXG00.85 Bankfull discharge = 17.1 cfs

Parameter	**MOS**	**Nat Back Load**	**Human-Caused Load**	**Load Allocation**	**TMDL**
Be (diss)	0.044	0.0046	0.17	0.17	0.22
Be (total)	9.5	0.011	0.22	0.22	9.7
Cd (diss)	0.029	0.0092	0.66	0	0.15
Cd (total)	0.42	0.013	1.4	1.4	1.8
Cu (diss)	0.12	29	97	0	0.62
Cu (total)	4.2	31	78	0	21
Zn (diss)	1.6	0.92	116	0	8.1
Zn (total)	209	0.63	120	120	330
H+ (pH)	2.70e-06	1.30e-03	2.30e-03	0.00e+00	1.30e-05

3R Canyon Load Table J 3R Canyon intermittent reach (nonpoint source)
Sample point: SCTHC003.03 Baseflow discharge = 0.11 cfs
Note: No natural background load applicable at this location at this discharge.

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Be (diss)	2.9E-04	N/A	2.4E-03	0	1.4E-03
Be (total)	6.1E-02	N/A	2.2E-03	2.2E-03	6.3E-02
Cd (diss)	2.6E-04	N/A	5.1E-03	0	1.3E-03
Cd (total)	2.7E-03	N/A	6.5E-03	6.5E-03	9.1E-03
Cu (diss)	1.2E-03	N/A	6.6	0	6E-03
Cu (total)	2.7E-02	N/A	6.6	0	0.13
Zn (diss)	1.6E-02	N/A	0.8	0	7.8E-02
Zn (total)	1.3	N/A	1	1	2.4
H+ (pH)	1.70e-08	N/A	1.10e-04	0.00e+00	8.60e-08

3R Canyon Load Table K 3R Canyon, Cox Gulch (all sources) (runoff)
Sample point: SCTHC003.03 Bankfull discharge = 42.5 cfs

Parameter	MOS	Nat Back Load	Human-Caused Load	Load Allocation	TMDL
Be (diss)	0.11	0.011	0.4	0.4	0.53
Be (total)	23	0.028	0.34	0.34	24
Cd (diss)	0.079	0.023	0.83	0	0.4
Cd (total)	1	0.033	1.5	1.5	2.6
Cu (diss)	0.35	73	1,929	0	1.7
Cu (total)	10	77	2,061	0	52
Zn (diss)	4.5	2.3	176	0	22

Zn (total)	520	1.6	232	232	753
H+ (pH)	6.70e-06	3.20e-03	1.00e-02	0.00e+00	3.30e-05

TMDL Implementation

This investigation shows that TMDLs will be met when the load reductions are achieved. The first phase investigation has identified the major sources of pollutant loading and quantified contributions so that management decisions can be made.

The target conditions for the subject basins include activities such as the removal of all mining residue dumps from the streambanks, the removal of all mining residue-originated sediments from the streambed and the isolation and treatment of all mining-impacted groundwater discharges (springs and adit drainage). While TMDL calculations and values may be different between pollutants, controlling the exposure of the source material to weathering, treating the runoff and removing stream sediments from segments where needed, will reduce all the 303[d]-listed pollutants to within standards or natural background levels.

For pollutant sources on Coronado National Forest land, USFS has a duty to apply for NPDES permits for both active and abandoned mines, on lands under their control, with potential to discharge to surface waters. Asarco is in the process of designing methods of passive treatment of the January Adit drainage to Alum Gulch.

ADEQ has divided the pollutant sources into categories based upon possible general remediation strategies. Responsible parties must undertake site specific studies before selection, design, and implementation of a remediation method can be accomplished.

Mining residue dumps can be remediated by:

Removing the material and either hauling to an active mine for processing with ore, or using the material to fill the abandoned mine works.

Leaving the material in place and preventing impacted runoff from reaching the stream. (This has been accomplished fairly successfully by Asarco at Trench Camp Mine.)

Combining impacted stream sediments with the mining residue dump material, and an acid neutralizing material; e.g., limestone or portland cement, for remediation.

The USGS has concluded that in addition to mine dump erosion, the accumulation of deposits in the streambed resulting from the evaporation of discharge from abandoned mine sites and mining-impacted springs is another large contributor to degraded streamflow when re-dissolved during storm events.

Public Participation and Responsiveness Summary

Development of the Alum Gulch, Harshaw Creek, and Three-R Canyon TMDLs included public participation in accordance with 40 CFR Parts 25 & 130.7. Public participation included review and input from stakeholder groups. Multiple presentations and meetings were held by the ADEQ in 1997 and 2001. These meetings were attended by owners/operators of mining sites, property owners; environmental groups; representatives of local, state, and federal agencies; and other interested members of the public. Written documentation of public participation is on file with ADEQ's Hydrologic Support and Assessment Section, located at 1110 W. Washington, 5th Floor, Phoenix, AZ 85007.

Commenters:

* Comments received to the first public notice of the Alum Gulch, Harshaw Creek, and Three-R Canyon TMDL reports include:

Public Notice Date: December 26, 2001

Asarco	February 8, 2002
James K. “Buck” Clark	February 5, 2002
Randy Heiss	January 2, 2002
Elizabeth Morton	(undated, received January 31, 2002)
Santa Cruz Natural Resource Conservation District	February 1, 2002
U.S. Environmental Protection Agency	February 7, 2002
U.S. Forest Service	January 29, 2002

* Comments received to the second public notice of the Alum Gulch TMDL report include:

Public Notice Date: September 3, 2002

Asarco	October 4, 2002

* Comments received to the third public notice of the Alum Gulch TMDL report and the second public notice of the Harshaw Creek include:

Public Notice Date: January 17, 2003

Asarco	March 14, 2003

* Comments received to the second public notice of the Three-R Canyon TMDL report include:

Three-R Public Notice Date: February 10, 2003

AZ Game and Fish	March 18, 2003

After the first public notice of these three TMDL reports, comments were considered and report revisions were made. Additionally, the report was bolstered with findings from a recently completed USGS study and updated to reflect the changes to surface water quality standards resulting from the 2002 triennial review. The changes due to comments, findings, and standards changes can be found throughout these reports. Too many changes were made to enumerate here. Comments that were not addressed through report revision and comments that came from the most recent round of public notice are addressed as follows. Several of the comments have been paraphrased.

COMMENT: The quantity of measured data is insufficient to accurately calculate a TMDL.

RESPONSE: ADEQ recognizes there are questions associated with the amount of data available, but is satisfied that the TMDL is of acceptable accuracy. A TMDL is not the last word, but the beginning of a process. ADEQ recognizes the need for further monitoring and data collection and has begun discussion with the USGS regarding Phase II. The fact remains that surface water quality standards are consistently being exceeded. Load contributions from identified

sources must be reduced. Responsible parties should begin monitoring their loads and plan how they will reduce their contributions.

COMMENT: "The draft also states that NPDES permits will be required for point sources. To the extent sources receive permits of any kind, the next phase of the TMDL should try to account for the reductions achieved in this fashion, at the same time as it further refines natural background and loading determinations. Loadings reasonably achieved in any permits would help determine appropriate future implementation measures.

Upper Alum Gulch is a prime candidate for a phased TMDL under A.R.S. § 49-234(H)."

RESPONSE: Discussion with the USEPA indicates conditional acceptance of the concept of a phased TMDL approach to the Alum Gulch, Harshaw Creek and Three-R Canyon TMDLs. One of the conditions of their acceptance of a phased TMDL is the commitment, to be identified via the implementation section of the TMDL report, of ADEQ to conduct follow-up monitoring and/or investigation to support the next phase of the TMDL.

COMMENT: "Nothing in Arizona's TMDL statute calls for EPA review of implementation measures. Therefore, although it is appropriate to include Section 7 in state TMDL documents, it should not be submitted to EPA unless required under federal law."

RESPONSE: The commentor is correct that ADEQ is not bound by state or federal law to submit implementation measures to USEPA for review or approval. Section 7 is a brief overview of potential implementation measures. ADEQ believes presentation of these measures is important to the reader's understanding of the issues and potential remedies. It is also important to inform the public and USEPA of ADEQ's plan for additional work on this set of TMDLs.

COMMENT: "...the next to last paragraph of this section implies that every key decision in the TMDL process, including each allocation and implementation measure, must be approved by EPA. ...we do not believe this represents the current state of the law."

RESPONSE: The referenced section of the report states: "Once TMDLs are developed for all the water quality problems, they are submitted to the EPA for review and approval." ADEQ is satisfied that this wording is consistent with the current state of the law as written.

COMMENT: "For Upper Alum Gulch (above the January adit), only a single sample has been collected ...That sample met all currently applicable standards for cadmium and copper. The only exceedences were for dissolved zinc (aquatic and wildlife uses) and pH. In both cases, the changes made recently as part of the triennial review may result in the current reading not constituting exceedances (there is no pH standard for ephemeral waters, and the removal of the chronic aquatic and wildlife criteria may result in the existing result meeting the remaining acute standard, depending on the hardness of the sample).

Moreover, with only one sample, Upper Alum Gulch cannot qualify as impaired under the new state TMDL rule, which requires more than one sample in any scenario. A.A.C. R18-11-605(D). Although A.A.C. R18-11-606(E) may allow ADEQ to complete a TMDL for a formerly listed water that no longer qualifies for listing, ADEQ's authority is discretionary ("The Department may complete...") and should not be exercised in this instance in light of the ephemeral nature of this segment and the minimal evidence of any problem.

Unless more data demonstrates a problem in Upper Alum Gulch, the commenter therefore suggests that Upper Alum Gulch be considered to be meeting applicable standards (i.e., not impaired) in the next phase of the TMDL. Certainly, copper and cadmium, where there is no evidence whatsoever of an exceedence, should not be identified as parameters being exceeded. With pH certain to drop out when the ephemeral classification is approved, and zinc possibly going to do so, efforts in Upper Alum Gulch should be either minimized or eliminated altogether."

RESPONSE: The changes to the surface water quality standards did not eliminate the pH standard for ephemeral waterbodies and the current dissolved zinc standard is still being exceeded. The USEPA, in its review of the state's 303(d) list, used its authority to keep Alum Gulch on the 303[d] list and therefore, ADEQ has to calculate the appropriate TMDL.

COMMENT: "...we understand that at least one field blank collected during ADEQ sampling indicated the presence of zinc. This could suggest that there may be some other source of contamination that could affect the results, which are not related to actual stream contamination."

RESPONSE: The samples in question were those ADEQ split, as a courtesy, with the commentor. These were not part of the project's quality assurance splits and blanks which were collected at other sample points.

This was the only instance of a detection of zinc in blanks and was determined to be a result of contamination of the rinse water supplied by the laboratory. Furthermore, the concentrations detected in the field blank were 20 to 40 µg/L while the stream concentration was over an order of magnitude higher at 470 µg/L. Considering that the zinc standard is only 65 µg/L for these samples, (based on the sample hardness) it is clear that the surface water quality standards were being exceeded even after ADEQ subtracted the highest concentration measured in a blank from the stream concentration.

The presence of a contaminant in rinse water on one occasion out of the over 70 samples collected as part of this project does not translate to casting doubt on the accuracy of the entire study.

COMMENT: "...we continue to have some concerns about dissolved readings exceeding total readings from the same sample in several of the reported sampling events listed in Tables 2A-2C."

RESPONSE: The dissolved concentrations are larger than the total concentrations due to rounding in reporting and because some samples were diluted due to matrix interference. (Carie Wilson, Bolin Laboratories, January 23, 1998) The data was validated by the laboratory.

COMMENT: "ADEQ proposes to use an explicit (15%) and an implicit (non-quantified) margin of safety. ADEQ does not explain how these margins of safety were chosen, but to some extent, both appear to have been included primarily as a hedge against errors predicated on the absence of adequate data. If this is the case, such an approach would be inconsistent with the provisions of A.R.S. § 49-234(C)(3). Moreover, ADEQ has not explained why it needs a significant implicit margin of safety (e.g., use of conservative assumptions) when it already includes a significant (15%) explicit margin of safety, as well as an additional 5% margin of safety to reflect likely variations in the precision of measurements. Combining these three margins of safety results in an extremely large margin of safety for Alum Gulch.

We would like to understand better the basis for the selected margin of safety and why ADEQ feels the need for such a large margin of safety in this case. Is this the approach that has been used in previous TMDLs?"

RESPONSE: The safety factor is not included as hedge against errors due to inadequate data, but it is primarily to allow for un-characterized or underestimated sources.

COMMENT: "We continue to question the appropriateness if (of) the AgL, FC, and FBC use designations for the non-ephemeral portions of Alum Gulch. The base flow that constitutes the "perennial" flow in this portion of Alum Gulch is clearly insufficient for submersion of game fish or humans of almost any size, and to our knowledge has never been used for livestock watering. We believe that a use attainability analysis would be warranted as part of the next phase of the TMDL to determine whether these uses are inappropriately designated for this reach.

In addition, depending on the results of the additional natural background sampling program, development of site specific standards may be appropriate."

RESPONSE: The question of whether the designated uses are appropriate should be addressed through the triennial review of the surface water quality standards. A use attainability analysis could be pursued by the commentor as part of that process. In addition, ADEQ observed cattle grazing on Asarco's Trench Camp Mine site in the headwaters of Alum Gulch and downstream from the mouth of Humboldt Canyon.

COMMENT: "The statement in the third paragraph that there are no known NPDES-permitted sources in the area is not correct. Asarco's Trench inactive facility has secured coverage under the industrial multi-sector general permit (MSGP) for a number of years. As you know, EPA has recently suggested that an individual NPDES permit may be more appropriate for at least the January Adit. (This same comment applies in Section 6.4.1.)"

RESPONSE: The commentor is correct and the text has been modified to note coverage under the MSGP. The commentor is also correct that EPA and ADEQ find the January Adit, by definition, to be a point source of pollutants that discharge to waters of the U.S., Alum Gulch, therefore requiring an individual NPDES permit.

COMMENT: "The draft concludes that the January Adit is a point source. Legally, there may be some question as to this conclusion. ...There are questions about the applicability of the NPDES and AZPDES programs at the January Adit. Nevertheless, Asarco has provisionally applied for an AZPDES permit for this site in response to receipt of a compliance order from EPA, although we have indicated our belief that an aquifer protection permit may be the more appropriate permit. We hope to have further discussions with ADEQ regarding the permitting approach. Regardless of which permit is ultimately determined to be appropriate, some time will be needed to assess the site and determine the best method for dealing with water coming from the adit."

RESPONSE: See previous response.

COMMENT: "In all of the reports, ADEQ suggests that controlling exposure, treating runoff and removing sediments from the stream should reduce pollutants to within standards. Qualitatively, these measures would certainly reduce loading from these sources. However, ADEQ has not attempted to quantify the reductions to be achieved by these steps. Therefore, it is not substantiated that the noted steps would solve all water quality problems. In addition, natural background also appears to exceed standards in some instances. ...Unless ADEQ is considering reducing exposure to areas of natural mineralization, implementing the suggested steps would likely not result in achieving standards everywhere in the streams."

"...we understand that it is likely that ADEQ plans to move forward with development of the final TMDL and, subsequent to that, the implementation plan. We urge the Department to build enough flexibility into that plan to allow for further collection of data to better calibrate the models used, and also to allow for revision of loading calculations that may be required in the event that applicable standards change."

RESPONSE: The reductions necessary to reach standards are shown in the report. Removing or isolating sources will result in the reductions. The TMDL is not intended to be an engineered evaluation. ADEQ only needs to indicate what must be reduced, not how it is to be achieved. ADEQ is proposing adoption of these three reports as Phase I TMDLs. Additional monitoring will result in further refinement of loading from all potential sources. These reports do reflect the surface water quality standards approved as part of Arizona's 2002 triennial review.

COMMENT: "...Trench Camp Mine and the January Adit are not active operations, and have in fact been closed for decades and reclamation has occurred (especially at Trench)." The reference to "probable pollutant sources" should refer to "historic" mining-related activities, since no mining has occurred for decades in this area.

RESPONSE: The text has been modified to reflect that no active mining is occurring nor has occurred for a number of years. However, the residue of mining activities remains both above and underground and this material is still contributing to pollution in the subject streams.

COMMENT: "...we do not believe that the piles at Trench Camp, which have been remediated (capped and revegetated), are being eroded and fed into the stream by runoff."

RESPONSE: ADEQ observed rills and small gullies in the faces of the piles and evidence that erosion is occurring after large storm events.

COMMENT: "...we question whether it was true at Trench that waste rock, low grade ore and tailings were placed in the same dumps. More commonly, tailings were placed in separate piles. Does ADEQ have information that would lead it to believe these different materials were intermingled at Trench Camp?"

RESPONSE: ADEQ did not analyze the composition of the dumps and is concerned with what is coming off the entire Trench Camp Mine Site and into the stream. Table 6A assigns loads, reductions, and TMDLs to the "Trench Camp Mine" runoff.

COMMENT: We feel that the Trench Camp Mine Site has been fully reclaimed and that existing controls are adequate. Any loading detected is the result of natural impacts.

RESPONSE: ADEQ's sampling indicates that the loading is not due to natural impacts since the sample was collected from flow running off of the Trench Camp Mine site; all other runoff is diverted from the former mine site and enters the stream downstream from the sample point. As part of the remediation, Asarco constructed berms and ditches to prevent natural runoff from flowing across the remediated areas. The samples were collected upstream from the point where the natural runoff and the mine runoff converge.

COMMENT: "For cadmium and copper in particular, there were significant differences between the natural background samples (e.g., one copper sample was 4 times the other). ADEQ appears to have simply estimated natural background by averaging the 2 results. This approach may not be valid - it is not clear from such limited data which result more closely approximates natural background most of the time, or whether such variations are in fact normal. This could affect load calculations, and introduces yet another source of uncertainty into the calculations (along with, inter alia, the paucity of overall data)."

RESPONSE: The commentor is correct that the two values were averaged. The report explains how and why the background sites were selected. Phase 2 of this study will attempt to further refine background levels, pollutant sources and their associated loading and necessary reductions.

COMMENT: "Has ADEQ selected the locations for the additional background samples that it plans to collect?"

RESPONSE: ADEQ is in the process of developing possible sampling scenarios for the next phase of investigation.

COMMENT: "The TMDLs may impact the AZPDES permit that Asarco has applied for with respect to the January Adit, as required by EPA. In some cases, the preliminary load calculations appear to call for complete elimination of all human-caused discharges. This is simply not feasible, nor is it reasonable to impose such a draconian limit given the uncertainty regarding load calculations and natural background concentrations. Moreover, given the other, far more significant sources of loading, present in the watershed, a zero discharge limit at the January Adit would not even come close to resulting in standards being achieved.

As noted above, a more reasonable approach is to assess reductions achieved by issuing the relevant permits at the same time as additional data is gathered and load analyses are refined in future phases of the TMDL."

RESPONSE: The TMDLs are presented by segment and/or source. The TMDLs and associated reductions are based on the data available. ADEQ may require, as a condition of the AZDES permit, additional monitoring by Ascro or additional best management practices to reduce any pollutant loadings.

COMMENT: "We understand, as ADEQ notes in its response to earlier comments, that clean sampling may not be necessary in light of the concentrations being detected in the few samples available. However, we continue to believe that clean sampling techniques should be used in future phases of the TMDL, especially with respect to determining natural background and refinement of load calculations. As you know, Asarco has been asked to apply for an AZPDES permit for the January Adit, and we believe the most accurate data possible should be collected if TMDL load calculations are going to be used to affect the conditions in that permit."

RESPONSE: With these reports, ADEQ followed the current USEPA-approved Quality Assurance Project Plan (QAPP) (May, 1991) and the ADEQ Fixed Station Network Procedures Manual derived from the QAPP. These contain the sampling techniques ADEQ followed as part of this project.

It should be noted that EPA's Method 1669, "Sampling Ambient Water for Determination of Trace Metals at EPA Water Quality Criteria Levels, EPA 821-R-95034 (1995)" states: "this method is not intended for determination of metals at concentrations normally found in treated and untreated discharges from industrial facilities. Existing regulations (40 CFR parts 400-500) typically limit concentrations to the mid to high part-per-billion (ppb) range, whereas ambient metals concentrations are normally in the low part-per-trillion (ppt) to low ppb range."

Due to the heavy mining and ore processing activity in the subject basins, the concentrations of the listed metals are not in the low part-per-trillion range, but are in the high part-per-billion and part-per-million ranges. The relevant standards for the subject streams are well within the detection limits for standard EPA methods, as opposed to the specialized 1600-series methods.

In January 2003, ADEQ's ambient and TMDL monitoring staff were trained in clean sampling techniques. ADEQ is also pursuing contracts with analytical laboratories capable of performing "clean" analytical methods. There are currently no laboratories Arizona licensed to perform EPA's 1600 series methods. In future TMDLs, ADEQ will determine whether clean sampling techniques are warranted for all or portions of the investigation based on factors including site conditions, pollutants of concern, and types of sampling being undertaken.

COMMENT: "The statement that dump number 3 at Trench Camp is likely a minor contributor of loading into Harshaw Creek is pure speculation. It would be more accurate to simply state that loadings from Trench Camp cannot be assessed at this time, but at most are likely to be minor based on Alum Gulch data (which is itself limited to a single sample that complied with most surface water quality standards)."

RESPONSE: ADEQ believes the statement in the report and the commentor's language are essentially identical. No change has been made.

COMMENT: "Can't the same case be made for copper as for zinc in Harshaw Creek? The only sample exceeding a copper standard is the natural background sample (see Table 2B)."

RESPONSE: As explained in the report (Page 5, Section 2, Paragraph 3), zinc did not exceed standards either measured or modeled; however, copper was shown to exceed standards in the model.

COMMENT: Perennial Spring downstream from the 3-R Mine has been reported (by Silver Eagle Resources) "as having different pH and mineral content than water in standing in the 3-R Mine."

RESPONSE: (Personal Communication with Mike Sierakoski (S & S International Mining), Silver Eagle Resources now Mercator Minerals, 06/03/02) Mr. Sierakoski states that sampling conducted by (then) Silver Eagle Resources suggests that there is not a connection between the 3R Mine workings and the spring on the stream. The limited sampling included metals, pH and some isotope analyses. ADEQ welcomes receipt of this data and any other geochemical or flow data for sites in this project area. However, the TMDL for copper as calculated for the spring is based solely on the water quality of the spring as collected by ADEQ and USGS. The potential for hydrologic connection between the spring and the mine workings (3R) was not discussed in the report.

COMMENT: (With respect to the Three-R TMDL) "I fail to see how the run off from above the mine when added to the run off from the spring has been accounted for."

RESPONSE: The loading worksheets for nonpoint sources of pollutants are cumulative. Loads at each monitoring location include that segment and what came from upstream. The spring is considered a "point source," so its contribution is shown as a discrete input at a monitoring location and included as part of the incoming load in downstream locations.

COMMENT: (With respect to the Three-R TMDL) The metals concentrations downstream from the spring are greatly increased by evaporation.

RESPONSE: Such evaporation, or more accurately the evaporative deposits left behind, are a major source of pollutant loading during runoff events. The metals, stored in these salts, become available when they come into contact with the low pH in the stream runoff.

COMMENT: "...there are underground workings and mill tailings downstream that also contribute to the problem."

RESPONSE: ADEQ agrees that there are numerous sources. As stated in the TMDL report, in this phase of the TMDL all significant sources have been identified. Future studies will further refine the sources and their contributions.

COMMENT: "The 3-R Mine may be the most obvious contributor but even if excluded would not bring the stream flow below the required standards."

RESPONSE: Section 4.0 of the TMDL report identifies significant sources and Tables 6A through 6K summarize the load allocations and load reductions necessary to meet the TMDLs for sources identified. The TMDLs are predicated on the notion their implementation will lead to surface water quality standards being met.

COMMENT: "...more data from flowing water should be used. Data from Floyd Gray's work with the USGS is probably available."

RESPONSE: Unfortunately, Mr. Gray did not measure flow while sampling in this project area. ADEQ has had numerous discussions with him and his experience and familiarity with the project area has provided very useful information regarding pollutant sources, loading mechanics, and natural background.

COMMENT: Will ADEQ address the linkage between subsurface mining impacts on groundwater and the groundwater linkage/impacts to surface water? More data is needed on groundwater and its impacts.

RESPONSE: An in depth groundwater investigation is beyond the scope of this TMDL project. Spring load allocations and reductions necessary to meet the TMDL can be found in Table 6D.

COMMENT: Review non-human species use?

RESPONSE: Section 3.0 of this TMDL report identified the numeric targets for the designated uses for each segment. The TMDLs are based on the maximum loadings allowable to achieve the most stringent designated use of each segment.

COMMENT: "The Asarco wetland was not vegetatively functional in the 1999-2001 period. Is it functional now?"

RESPONSE: Currently the wetland is not functional; however, Asarco is working on a redesign of a treatment system for January Adit.

COMMENT: The commentor had a number of questions and comments regarding relationship between zinc and manganese, secondary MCLs, precautions during remediation, and remediation techniques using limestone.

RESPONSE: These questions and comments are beyond the scope of this TMDL project.

NOTICE OF PUBLIC INFORMATION

DEPARTMENT OF HEALTH SERVICES

1. **Title and its heading:** 9, Health Services
Chapter and its heading: 20, Department of Health Services
Behavioral Health Service Agencies: Licensure
Articles and their headings: 1, General
2, Universal Rules
3, Outpatient Clinic Requirements
4, Residential Agency Requirements
5, Inpatient Treatment Program Requirements
6, Use of Restraint or Seclusion
7, Level 1 Specialized Transitional Agency
8, Court-Ordered Services
9, DUI
10, Opioid Treatment
11, Misdemeanor Domestic Violence Offender Treatment
12, Level 4 Transitional Agency
13, Shelter for Victims of Domestic Violence
14, Rural Substance Abuse Transitional Agency
15, Adult Therapeutic Foster Home
Section numbers: R9-20-101 through R9-20-1508

2. **The public information relating to the listed Sections:**

This Notice of Public Information provides notice that the Department of Health Services will hold a public hearing to obtain public comment about proposed exempt rules regulating licensure of behavioral health service agencies. The proposed exempt rules incorporate changes that clarify meaning and reflect statutory changes and current standards of practice. The changes will be promulgated in rule under exempt rulemaking procedures according to Laws 2001, Ch. 367 (SB 1353).

Copies of the proposed exempt rules may be obtained on or after June 2, 2003 by going to the draft rulemaking link on the Department of Health Services web site (www.hs.state.az.us/diro/admin_rules/index.htm), or by calling Johnie Golden, Program Manager, at (602) 674-4300.

3. **The name, address, and telephone number of agency personnel to whom questions and comments on the rules may be addressed:**

Name: Johnie Golden, Program Manager

Address: Office of Behavioral Health Licensure
Arizona Department of Health Services
1647 E. Morten, Suite 240
Phoenix, AZ 85020

Telephone: (602) 674-4300

Fax: (602) 861-0643

or

Name: Kathleen Phillips, Rules Administrator

Address:	Arizona Department of Health Services 1740 W. Adams, Room 102 Phoenix, AZ 85007
Telephone:	(602) 542-1264
Fax:	(602) 364-1150

4. The time during which the agency will accept written comments and the time and place where oral comments may be made:

The dates, times, and places of the public hearings are as follows:

Date:	June 16, 2003
Time:	10:00 a.m.
Address:	1647 E. Morten Hearing Room Phoenix, AZ 85020
	and
Date:	June 17, 2003
Time:	10:00 a.m.
Address:	400 W. Congress North Building, Room 158 Tucson, AZ 85701
	and
Date:	June 18, 2003
Time:	10:00 a.m.
Address:	East Flagstaff Public Library 3000 N. 4th Street, Suite 5 Community Room Flagstaff, AZ 86004

Persons interested in submitting written formal comments should submit them to one of the persons listed in item #3 by 5:00 p.m. on June 18, 2003.

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting one of the persons listed in item #3. Requests should be made as early as possible to allow time to arrange the accommodation.