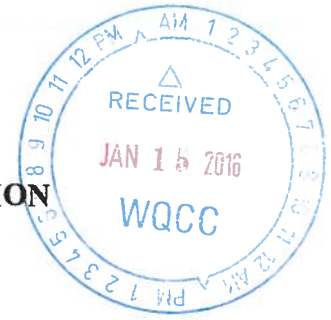

STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION

IN THE MATTER OF THE TRIENNIAL REVIEW OF STANDARDS FOR INTERSTATE AND INTRASTATE SURFACE WATERS, 20.6.4 NMAC

WQCC NO. 14-05 (R)

CHEVRON MINING INC.'S PROPOSED STATEMENT OF REASONS AND CLOSING LEGAL ARGUMENT

Chevron Mining Inc. ("CMI"), pursuant to the Scheduling Order and Section J of the Procedural Order, hereby submits its proposed Statement of Reasons and Closing Legal Argument.

INTRODUCTION

This matter is before the Water Quality Control Commission ("WQCC" or "the Commission") on the petitions of a number of parties, including the Surface Water Quality Bureau of the New Mexico Environment Department's Water Protection Division ("Department") and Amigos Bravos, for changes to several provisions of the Standards for Interstate and Intrastate Surface Waters, 20.6.4 NMAC.

CMI did not propose any changes to the 20.6.4 NMAC standards in this Triennial Review. In its Notice of Intent to Present Technical Testimony, CMI stated its position on certain proposals submitted by Peabody Energy and Amigos Bravos. Peabody Energy withdrew its proposals prior to the hearing, and thus, CMI will not address its support for those proposals here.

CMI opposed Amigos Bravos' proposed amendments to the aquatic life criteria in 20.6.4.900.I and 900.J NMAC for aluminum. Amigos Bravos' Proposed Amendments and Statement of Basis, Pleading Log 9. On December 12, 2014, CMI filed its notice of intent to present the technical testimony of Robert W. Gensemer, Ph.D., Vice President and Senior

Ecotoxicologist for GEI Consultants, Inc. Chevron Mining Inc.'s Notice of Intent to Present Technical Testimony, Pleading Log 23. CMI filed the rebuttal testimony of Dr. Gensemer on February 13, 2105. Rebuttal Testimony of Robert W. Gensemer, Ph.D. GEI Consultants, Inc., Pleading Log 38. Dr. Gensemer also gave oral testimony at the Triennial Review hearing on October 15, 2015. Tr. Vol. III, 682-733.

The Department also opposed Amigos Bravos' proposed changes to the aluminum criteria, presenting the testimony of Bryan Dail, Ph.D on that issue in both pre-filed rebuttal testimony and oral testimony at the hearing on October 15, 2015. Rebuttal Testimony of Bryan Dail, Pleading Log 34, Exh. 14; Tr. Vol. IV, 903-916.

For the reasons stated below, the Commission should reject Amigos Bravos' proposed changes to the to the aquatic life criteria in 20.6.4.900.I and 900.J NMAC for aluminum.

STANDARD OF DECISON

Pursuant to the New Mexico Water Quality Act ("WQA"), NMSA 1978, § 74-6-4.D (2009), the Commission is directed to adopt water quality standards based on credible scientific data and other appropriate evidence. Standards adopted by the Commission include narrative standards, designated uses, and water quality criteria necessary to protect such uses. "Criteria" are defined under the WQA implementing regulations as "elements of state water quality standards, expressed as constituent concentrations, levels or narrative statements, representing a quality of water that supports a use. 20.6.4.7(A)(7) NMAC. Section 303(c)(1) of the federal Clean Water Act, 33 U.S.C. § 1313(c)(1), requires that the State hold public hearings at least once every three years for the purpose of reviewing water quality standards and proposing necessary revisions to such standards. In adopting standards, the Commission "shall give weight it deems appropriate to all facts and circumstances, including the use and value of the water for

water supplies, propagation of fish and wildlife, recreational purposes and agricultural, industrial and other purposes[.]" Section 74-6-4.D. Standards must "at a minimum protect the public health or welfare, enhance the quality of water and serve the purposes of the Water Quality Act." *Id.* A party proposing changes to existing standards bears the burden of demonstrating that the proposed changes are warranted and appropriate. *See Tenneco Oil Co. v N.M. Water Quality Control Comm'n*, 1987-NMCA-153, ¶ 8, 107 N.M. 469, 760 P.2d 161.

ARGUMENT

The current aluminum criteria were adopted by the Commission based on changes proposed by CMI and Los Alamos National Security ("LANS") during the last Triennial Review of Surface Water Quality Standards in 2009 ("2009 Triennial Review"). In those proceedings, Dr. Gensemer provided expert testimony on behalf of LANS, and Steve Canton provided expert testimony on behalf of CMI in support of changes to the aluminum criteria then in existence (the "pre-2009 Al criteria"). Amigos Bravos now proposes that the Commission withdraw the current hardness-based aluminum criteria adopted in the 2009 Triennial Review, and revert back to the pre-2009 Al criteria. The Commission should reject this proposal because the current criteria are technically supported and protective of aquatic life in New Mexico, and reinstatement of the pre-2009 Al criteria would not be appropriate.

I. The Current Hardness-Based Al Criteria Were Fully Supported At the Time of Their Proposal in 2009, and Secured EPA's Approval in 2012

Dr. Gensemer testified regarding the adoption of the current aluminum criteria. The pre-2009 Al criteria were based on the United States Environmental Protection Agency's ("EPA") nationally-recommended ambient water quality criteria ("AWQC"), adopted by EPA in 1988. Between the time when EPA released the 1988 AWQC and the 2009 Triennial Review, several acute and chronic aluminum toxicity studies were published in the scientific literature suggesting

that the national criteria needed to be updated. These studies, many of which met EPA guidelines for AWQC development, resulted in data for deriving an acute-to-chronic ratio for aluminum, and demonstrated that the toxicity of aluminum to aquatic life is hardness-dependent – i.e., aluminum toxicity is greater in softer waters and decreases as water hardness increases. Gensemer Direct at 3.

Based on these studies and the data they produced, LANS and CMI proposed an updated, hardness-based Al criteria in the 2009 Triennial Review. The expert testimony submitted by LANS and CMI in the 2009 Triennial Review provided a full review of the scientific literature at that time, and used EPA guidelines to derive the new hardness-based Al criteria. Prior to deriving the new Al criteria, the available toxicity literature was extensively reviewed to ensure adherence to EPA study quality and minimum database requirements. In the Record of Decision Addendum accompanying EPA's approval of the hardness-based Al criteria, EPA acknowledged that "GEI generally followed methods outlined in EPA's criteria derivation and recalculation procedures . . . ." Gensemer Direct at 7. The Commission ultimately adopted the new hardness-based Al criteria, and EPA approved the criteria in its Record of Decision ("ROD") issued on April 30, 2012. Gensemer Direct at 7.

The current criteria underwent significant technical review prior to EPA's approval in the ROD. This review included the following:

1. Pre-filed direct testimony submitted by CMI's and LANS' experts was subject to thorough technical review by both the Department and EPA, prompting a series of technical questions for which responses were prepared in the form of pre-filed rebuttal testimony by both proponents. Gensemer Direct at 7.

2. Both Dr. Gensemer and Mr. Canton presented oral testimony during the 2009 Triennial Review hearing. This testimony, and related cross-examination by NMED, addressed many of the same technical comments raised and discussed in pre-filed rebuttal testimony. Gensemer Direct at 8.

3. The WQCC issued its Order and Statement of Reasons for Amendment of Standards, concluding that: "The Commission adopts the proposal by [CMI and LANS/DOE] to replace the current acute and chronic aquatic life criteria for aluminum in section 900.J with hardness-based criteria and to show total aluminum in this subsection to reflect findings of new toxicological studies." Order and Statement of Reasons; WQCC 2010b; paragraph 511

4. In its initial ROD for the 2009 Triennial Review, EPA did not act on the hardness-based aluminum criteria, primarily due to concerns pertaining to application of these criteria outside the pH range of 6.5 – 9.0, suggesting that "additional review of the GEI document is warranted" (USEPA 2011, pages 117-118). Responses addressing USEPA's concerns as expressed in the initial ROD were provided jointly by both Dr. Gensemer and Mr. Canton and submitted to NMED in 2011. Gensemer Direct at 8.

5. USEPA issued its ROD Addendum approving the hardness-based aluminum criteria for waters of pH between 6.5 – 9.0, but disapproving these criteria for waters below 6.5, stating in the transmittal letter:

> Based on an extensive review of the supporting documentation, we are approving the application of the hardness-dependent equation for aluminum to those waters of the State at a pH of 6.5 to 9.0 because it will yield criteria that are protective of applicable uses in waters within that pH range.

EPA had also noted in previous comments that the new hardness-based Al criteria were an improvement over the previous criteria adopted in 1988. Dail Rebuttal at 15-16 (citing EPA's

letter dated Dec. 16, 2011, commenting on New Mexico's 2008-2010 Triennial Review, SWQB Rebuttal Exh. 16); Tr. Vol. IV, 905:2-9 (Dail).

Thus, the Commission and EPA determined that the current hardness-based Al criteria are fully protective of aquatic life in New Mexico, within the intended pH range of 6.5 – 9.5, at the same levels of protection set forth under the Clean Water Act. Gensemer Rebuttal at 7.

II. Amigos Bravos Has Not Shown That the Current Al Criteria Are Not Sufficiently Protective of Aquatic Life

In its testimony presented in these proceedings, Amigos Bravos raised a number of concerns regarding the technical basis and the protectiveness of the current hardness-based Al criteria. Importantly, Amigos Bravos did not challenge the technical basis or protectiveness of the current hardness-based Al criteria during the 2009 Triennial Review, and did not appeal the WQCC's adoption, or EPA's approval, of those criteria. In the current proceeding, as the party proposing changes to an existing water quality standard, Amigos Bravos bears the burden of demonstrating that its proposed changes to the current hardness-based Al criteria are appropriate. *See Tenneco Oil Co. v N.M. Water Quality Control Comm'n*, 1987-NMCA-153, ¶ 8, 107 N.M. 469, 760 P.2d 161. Dr. Gensemer's and Dr. Dail's testimony demonstrates that Amigos Bravos has not sustained this burden.

The issues raised by Amigos Bravos can be grouped into several areas, which are summarized, along with the responses from Dr. Gensemer and Dr. Dail, as follows.

A. Concerns Regarding pH Effects

Amigos Bravos raised the following points regarding the effects of pH on aluminum toxicity:

1. Dr. Gundersen testified that hardness has only a minor effect on aluminum toxicity and may not be protective at near-neutral to alkaline pH compared to other water-quality parameters (pH, DOC, temperature). Gundersen Direct at 9.

Dr. Gensemer pointed to his direct testimony from the 2009 Triennial Review, which recognized that *overall* there is a significant effect of pH on aluminum toxicity, however, no significant statistical relationship could be observed based on the acceptable toxicity tests that were available at the time over the pH range of 6.5 – 9.0. Therefore, whether or not pH had a statistically stronger effect than hardness in a single study (e.g., Gundersen et al. 1994) does not invalidate the lack of pH effect that was observed from the multiple species and studies used in GEI's analysis. Dr. Gensemer works with the European Aluminium Association project team, which has developed and will soon be publishing a larger and more extensive database that evaluates the relative impacts of hardness vs. other water quality parameters (including the pH 6.0 data from Stubblefield et al. 2012). However, Dr. Gensemer stated his opinion that these data do not *invalidate* the effects of hardness, but rather will *include* the additional effects of pH, DOC, and temperature. In other words, the existing hardness equation can still be considered protective of aquatic life over the pH range of 6.5 – 9.0, even if the ability to predict aluminum toxicity based on multiple water quality factors in addition to hardness is improving as these new data are evaluated. Gensemer Rebuttal at 19-20.

2. Dr. Gundersen testified that there is little data in existence for aluminum toxicity at pH range 8.5 through 9.0. Gundersen Direct at 10.

Dr. Gensemer explained that, while this is a correct statement, it does not invalidate the fact that EPA approved the New Mexico hardness-based criteria with full awareness of this limitation, and that Amigos Bravos' own suggestion to revert to the national AWQC for

aluminum (USEPA 1988) effectively suffers from the same data limitation. Thus, Amigos Bravos' proposal does no more to correct this situation than the existing, and more scientifically reasonable, hardness-based aluminum criteria. Dr. Gensemer further pointed to recent studies suggesting that the aluminate anion ($Al(OH)_4^-$, which predominates aluminum speciation as pH increases beyond 8.5) is not likely to be as bioavailable or as toxic as the forms of aluminum that exist within the more typical circumneutral to weakly alkaline pH range covered by the New Mexico hardness-based criteria. Gensemer Rebuttal at 20-21.

3. The current hardness-based standard fails to address important pH effects at pH levels above 7.5, a condition that is prevalent in many New Mexico streams. Amigos Bravos Proposal at 9.

As Dr. Gensemer testified, this assertion was based on a single study that did not provide a technical basis for the extrapolation made by Amigos Bravos, and that used an exposure period that was far too short to be considered acceptable for use in deriving chronic water quality criteria under EPA guidance. Gensemer Direct at 9. There is no technical basis to support Amigos Bravos' contention that the hardness-based criteria adopted by the WQCC in the 2009 Triennial Review would not be protective at pH greater than 7.5, particularly under chronic exposure conditions. The USEPA-approved hardness-based Al criteria for waters of pH between 6.5 and 9.0 were derived according to USEPA guidance (USEPA 1985), and the levels of aquatic life protection afforded by these criteria are consistent with the goals of the Clean Water Act.

B. Concerns Regarding Procedures Used to Derive the Current Al Criteria

Amigos Bravos raised the following points regarding the procedures used to derive the current Al criteria:

1. GEI's reports describing procedures for calculating hardness-based Al criteria for New Mexico, Colorado, and West Virginia did not provide "sound scientific evidence that the current 1988 EPA criteria were 'substantially overprotective' or that the new information presented a sound scientific basis for changing the EPA standard." Gundersen Direct at 3.

Dr. Gensemer testified at length regarding the scientific basis for the current standard, both in the 2009 Triennial Review proceedings and the current proceeding, and EPA itself approved the new hardness-based standard. Gensemer Direct at 3-8; Gensemer Rebuttal at 3; Tr. Vol. III, 708:4-709:17 (Gensemer).

2. EPA is currently in the process of revising the 1988 Al standard, and is evaluating use of a simplified aluminum Biotic Ligand Model using four parameters – pH, dissolved organic carbon, hardness, and temperature – and application of New Mexico's hardness-based Al criteria before this revision and other soon-to-be published studies is not practical or scientifically sound. Gundersen Direct at 4.

Again, EPA has approved the current Al standard, stating that it is an improvement on the pre-2009 Al criteria. Moreover, as testified by Dr. Gensemer, EPA's efforts to update the 1988 criteria on the basis of a number of water factors including hardness, pH, dissolved organic carbon, and temperature, do not invalidate the important role of hardness. Gensemer Rebuttal at 22. Nor do EPA's efforts warrant reverting back to a standard that includes ***none*** of the relevant water quality factors being considered. Gensemer Rebuttal at 20; Dail Rebuttal at 20-21; Tr. Vol. III, 695:9-17; 698:21-699:10 (Gensemer).

3. Amigos Bravos points to the differences between the hardness-based aluminum equations considered and/or adopted by New Mexico, Colorado, and West Virginia, as well as those developed by the EPA-funded Arid West Water Quality Research Project ("AWWQRP"),

as indicative of "a lack of understanding and lack of data needed to properly calculate hardness-based equations either nationally, regionally, or on a site-specific basis." Gundersen Direct at 4-6.

Dr. Gensemer testified at length regarding the reasons for the differences between various proposed and final hardness-based criteria for New Mexico, Colorado, and West Virginia. *See* Gensemer Rebuttal at 6-9. This testimony demonstrated that such differences were mostly a reflection of differences in the outcome of stakeholder deliberation and compromises reached during the public hearing process, rather than scientific information that would warrant changes to the existing, EPA-approved, New Mexico hardness-based criteria equations. Gensemer Rebuttal at 9.

4. Amigos Bravos claims that GEI's derivation of the current aluminum criteria equations omitted data from recreationally important species, namely rainbow trout, and suggested inclusion of certain studies, including Thompson et al. (1988) and Gundersen et al. (1994). Gundersen Direct at 6-7.

In his testimony, Dr. Gensemer explained why the Thompson et al. (1988) and some of the Gundersen et al. (1994) data were excluded from the 2009 aluminum criteria proposals by CMI and LANS. Gensemer Rebuttal at 10-13. Moreover, Dr. Gensemer testified that calculation of the New Mexico aluminum criteria equations does, in fact, include data from recreationally important species such as rainbow trout, including acute toxicity tests conducted at several hardness values at pH 8.3 (Gundersen et al. 1994). Further, all decisions respecting exclusion of particular studies were subject to review by all parties to the 2009 Triennial Review (including Amigos Bravos), and were ultimately reviewed and approved by EPA. Gensemer Rebuttal at 10.

5. Dr. Gundersen testified that certain studies used by GEI to derive the current hardness-based aluminum criteria were "scientifically questionable" and should not have been used. Gundersen Direct at 7-8.

Again, all decisions respecting inclusion or exclusion of particular studies were subject to review by all parties to the 2009 Triennial Review (including Amigos Bravos), and were ultimately reviewed and approved by EPA. Further, Dr. Gensemer explained at length in his testimony regarding the decisions to include the Khangarot (1991) study, and the *Daphnia magna* studies (Biesinger and Christensen 1972; Kimball et al., manuscript). Gensemer Rebuttal at 13-17. This testimony supports the decision to include such studies in the derivation of the current New Mexico aluminum criteria.

6. Dr. Gundersen expressed concern regarding the application of data used to derive parameters for the New Mexico acute equation (i.e. pooled-hardness slope) to the chronic equation, stating that peer-reviewed research indicates that the mechanisms for aluminum acute and chronic toxicity differ. Gundersen Direct at 8-9.

Dr. Gensemer's testimony explains that the existing science does not suggest that there are fundamentally different acute and chronic toxicity mechanisms for aluminum. Both mechanisms – ionoregulatory disturbance and respiratory distress – have been observed using both acute and chronic exposures. Thus, Dr. Gundersen's claimed difference in the mechanisms of aluminum toxicity for acute and chronic exposures does not provide a valid basis for dismissing application of the acute hardness slope to the chronic criteria equation. Gensemer Rebuttal at 17-19.

C. Concerns Regarding Whether it is Hardness or Calcium that Actually Mitigates Aluminum Toxicity

Dr. Gundersen testified that it was misleading to state that hardness (magnesium and calcium measured as $CaCO_3$) ameliorates aluminum toxicity when many scientific studies show that only calcium ameliorates aluminum toxicity. Gundersen Direct at 11-12.

Dr. Gensemer explained that the hardness-toxicity relationship derived for the 2009 Triennial (LANS 2009a, GEI 2009) was based on the empirical relationships between measured water hardness and toxicity. Because calcium's contribution to hardness is clearly included in any empirical measurement of water hardness using standard analytical methods, any effects of calcium ions on toxicity will be incorporated into the relationship (i.e., the hardness slope of 1.3695). While most of the studies on aluminum toxicity that Dr. Gensemer previously reviewed (Gensemer and Playle 1999) did indeed focus on calcium effects, this does not necessarily mean that magnesium will have no effects on aluminum toxicity. In fact, Dr. Gensemer testified that he was not immediately aware of any studies that have independently studied the relative effects of calcium vs. magnesium on aluminum toxicity as has been done for other metals such as copper (Welsh et al. 2000, Naddy et al. 2002). However, this is still logically irrelevant because if—as Amigos Bravos implies—only calcium ameliorates aluminum toxicity, then the presence of any magnesium in exposure waters will have no impact on the resulting empirical relationship between hardness and toxicity. Gensemer Rebuttal at 21-22

III. A Return to the Pre-2009 Al Criteria Is Not Technically Supported

As indicated in the discussion above, a number of the concerns raised by Amigos Bravos regarding the current aluminum criteria apply equally to the pre-2009 Al criteria, and thus do not warrant reverting back to the old, outdated criteria. Such concerns included inclusion of the Kimball et al. studies, and limited data existing at pH ranging from 8.5 – 9.0. Gensemer Rebuttal

at 16, 20. Even EPA noted that the current New Mexico criteria represent an improvement on EPA's existing nationally-recommended AWQS for aluminum. EPA had also noted in previous comments that the new hardness-based Al criteria were an improvement over the previous criteria adopted in 1988. *See* Dail Rebuttal at 15-16.

Moreover, the pre-2009 Al criteria cannot be viewed as necessarily "more protective" than the current standard, as Amigos Bravos suggests. As Dr. Gensemer explained, the toxicology of aluminum is a threshold analysis, meaning that, just because concentrations are below what is considered a safe level does not mean it is safer the further you get below that level. As long as concentrations are below the criteria threshold, they are equally protective. Tr. 709:2-17 (Gensemer). Additionally, as Dr. Dail testified the pre-2009 Al criteria would actually offer less protection at lower water hardness, a condition that frequently occurs in New Mexico waters. Tr. 907:18-22 (Dail); Dail Rebuttal at 10-45 to 11-45.

CONCLUSION

The technical testimony provided by CMI and NMED in this proceeding demonstrated that returning to the 1988 AWQC Al as the basis of New Mexico's water quality standards for aluminum would represent a retreat to an outdated scientific approach that does not address the important influence of hardness on aluminum toxicity in freshwater. The Commission should reject the changes to the current New Mexico aluminum surface water criteria proposed by Amigos Bravos.

PROPOSED STATEMENT OF REASONS

1. The Commission declines to adopt the proposal of Amigos Bravos to set aside the current hardness-based aquatic life criteria for aluminum at 20.6.4.900.I and 900.J NMAC,

which were adopted in the 2009 Triennial Review, and revert back to the pre-2009 aluminum criteria. Amigos Bravos' Proposed Amendments and Statement of Basis, Pleading Log 9.

2. The Commission adopted the current criteria in the 2009 Triennial Review based on proposals submitted by CMI and Los Alamos National Security. Dr. Gensemer provided technical testimony in the 2009 Triennial Review on behalf of LANS, along with Steve Canton, who provided technical testimony on behalf of CMI. Gensemer Direct at 7.

3. The expert testimony submitted by CMI and LANS in the 2009 Triennial Review provided a full review of the scientific literature at that time, and used EPA guidelines to derive new, hardness-based criteria. Gensemer Direct at 7-8.

4. Amigos Bravos was a party to the 2009 Triennial Review and did not submit technical testimony regarding CMI's and LANS's proposed changes to the aluminum criteria, or otherwise challenge those proposals. Tr. Vol. III, 664:16-666:14 (Conn). Virtually all of the scientific studies cited by Amigos Bravos in the current Triennial Review were available at the time of the 2009, and so could have been used as the basis of comments at that time. Gensemer Rebuttal at 11.

5. The Commission adopted the changes proposed by CMI and LANS, with certain modifications, finding that EPA's standards document and the 1988 national aluminum toxicity databases upon which the pre-2009 aluminum criteria were based did "not reflect current scientific understanding of aluminum toxicity to aquatic life." 2009 Order and Statement of Reasons at 122, ¶ 512. The Commission further found that "[T]he newer scientific literature demonstrates that hardness has a significant influence on aluminum toxicity and, hence, should be incorporated into regulatory criteria." *Id.* at 123, ¶ 517.

6. On April 30, 2012, the U.S. Environmental Protection Agency ("EPA") issued its amended Record of Decision approving the hardness-based aluminum criteria for waters of pH between 6.5 and 9.0. EPA found that the new criteria were "protective of applicable uses in waters within that pH range." Gensemer Direct at 7.

7. Amigos Bravos did not appeal either the Commission's adoption of the hardness-based aluminum criteria in the 2009 Triennial Review, or EPA's approval of those criteria. Tr. Vol. III, 664:16-666:14 (Conn).

8. Amigos Bravos has not shown that the current hardness-based criteria are insufficiently protective of aquatic life, or that they are not technically supported.

9. New data evaluating the relative effects of hardness vs. other water quality parameters (pH, dissolved organic carbon, temperature) do not invalidate the effects of hardness on aluminum toxicity. The existing hardness equation is still considered protective of aquatic life over the pH range of 6.5 to 9.0, even if the ability to predict aluminum toxicity based on multiple water quality factors in addition to hardness is improving as new data are evaluated. Gensemer Rebuttal at 19-20; Tr. Vol. III, 698:3 – 699:10 (Gensemer).

10. While there is little data in existence for aluminum toxicity at pH range 8.5 to 9.0, EPA approved New Mexico's hardness-based aluminum criteria with full awareness of that limitation. Moreover, the pre-2009 Al criteria that Amigos Bravos proposes the Commission to reinstate suffer from this same limitation. Gensemer Rebuttal at 20-21; Tr. Vol. III, 699:11-25 (Gensemer).

11. EPA's ongoing efforts to update the 1988 criteria on the basis of a number of water quality factors including hardness, pH, dissolved organic carbon, and temperature do not invalidate the important role of hardness, and do not warrant reverting back to criteria that

include ***none*** of the relevant water quality factors currently being considered by EPA. Gensemer Rebuttal at 20; Tr. Vol. III 695:9-17; 698:2 (Gensemer).

12. Differences between the hardness-based aluminum equations considered and/or adopted by New Mexico, Colorado, and West Virginia, as well as those developed by the EPA-funded Arid West Water Quality Research Project ("AWWQRP") are mostly a reflection of differences in the outcome of stakeholder deliberation and compromises reached during the public hearing process, rather than new and acceptable scientific information that would warrant changes to the existing EPA-approved New Mexico hardness-based criteria equations. Gensemer Rebuttal at 6-9.

13. The calculation of the current New Mexico hardness-based criteria equations includes data from recreationally important species such as rainbow trout, including acute toxicity tests conducted at several hardness values at pH 8.3. Gensemer Rebuttal at 9-13.

14. Existing science does not suggest that there are fundamentally different acute and chronic toxicity mechanisms for aluminum. Both ionoregulatory disturbance and respiratory distress have been observed using both acute and chronic exposures. Thus, claimed differences in the mechanisms of aluminum toxicity for acute and chronic exposures do not provide a valid basis for dismissing application of the acute hardness slope to the chronic criteria equation. Gensemer Rebuttal at 17-19; Tr. Vol. III, 696:5 – 697:14 (Gensemer).

15. A number of the concerns raised by Amigos Bravos relating to the current hardness-based criteria apply equally to the pre-2009 Al criteria, and thus do not warrant reverting back to the older criteria. *See, e.g.*, Gundersen Rebuttal at 16, 20.

16. The pre-2009 Al criteria would offer less protection at lower water hardness, a condition that frequently occurs in New Mexico streams. Dail Rebuttal at 10-11; Tr. Vol. IV, 907:18-22.

17. The current EPA-approved hardness-based Al criteria for waters of pH between 6.5 and 9.0 were derived according to EPA guidance, and the levels of aquatic life protection afforded by these criteria are consistent with the goals of the Clean Water Act. Gensemer Direct at 5-8.

18. A reversion back to the pre-2009 Al criteria is without technical support, and would represent a retreat to an outdated scientific approach that does not address the important influence of hardness on aluminum toxicity in fresh water. Gensemer Direct at 10.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of ***Chevron Mining Inc.'s Proposed Statement of Reasons and Closing Legal Argument*** was sent via electronic mail and/or hand delivered to the following counsel of record:

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