State of New Mexico

Water Quality Control Commission

2010 – 2012 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated Report

- Appendix C -

Response to Comments

Prepared by:
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RESPONSE TO COMMENTS

ON THE

2010-2012 STATE OF NEW MEXICO
CLEAN WATER ACT
§303(d)/§305(b)
INTEGRATED LIST OF ASSESSED SURFACE WATERS

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PLEASE NOTE:

Original typed letters that were not received electronically were scanned and converted to MSWord. Letters received electronically were also converted to MSWord. All text was converted to Arial 11 font with standard page margins for ease of collation. Contact information such as phone number, street addresses, and emails from private citizens were removed for privacy reasons. All originals letter of comment are on file at the SWQB office in Santa Fe, NM.

COMMON ACRONYMS

20.6.4 NMAC	State of New Mexico Standards for Interstate and Intrastate Surface Waters (as amended through August 1, 2007)
AU	Assessment Unit
EPA	US Environmental Protection Agency
IR	Integrated Report
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
ROD	Record of Decision (for the 303(d) list)
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
USEPA	United State Environmental Protection Agency
WQ	Water Quality
WQCC	Water Quality Control Commission
WQS	Water Quality Standards
WRAS	Watershed Restoration Action Strategy
WWTP	Wastewater Treatment Plant

CHANGES TO THE DRAFT 2010-2012 LIST BASED ON ADDITIONAL SWQB STAFF REVIEW:

1. There was one problem with an database - generated Integrated Reporting (IR) category that was corrected:

WATERSHED NAME	AU ID	AU NAME	DRAFT IR_category	CORRECTED IR_category
Animas Watershed	NM-2403.A_00	Animas River (San Juan River to Estes Arroyo)	5/5A	4A

2. The 2010 ACTION in the draft 2010 ROD correctly noted that Assessment Unit “Rio Cebolla (Fenton Lake to headwaters)” should be listed for turbidity. This inadvertently was not added to the Assessment Database (ADB). This cause of impairment has been added to this waterbody on the final draft 2010-2012 Integrated List.
3. The 2008 ACTION in the draft 2010 ROD and final 2008 ROD correctly noted that Assessment Unit “Ponil Creek (US 64 to confl of North & South Ponil)” should be listed for E. coli. This inadvertently was not added to the Assessment Database (ADB). This cause of impairment has been added to this waterbody on the final draft 2010-2012 Integrated List.
4. The Assessment Unit named “South Ponil Creek (Ponil Creek to headwaters) was split into two AUs at Middle Ponil Creek to due to differences in land uses and differing assessment conclusions derived from assessing each station separately.

COMMENT SET 1 – US Section International Boundary and Water Commission (USIBWC), El Paso, TX

International Boundary and Water Commission
United States and Mexico
Office of the Commissioner United States Section
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, Texas 79902
http://www.ibwc.state.gov

February 10, 2010

Water Quality Bureau
c/o Lynette Guevara
NMED-S WQB, Room N2 163
P.O. Box 5469
Santa Fe, NM, USA 87502

Dear Ms. Guevara:

The United States Section, International Boundary and Water Commission (USIBWC) has reviewed the 201 0-2012 State ofNew Mexico CWA §303(d)/§305(b) Integrated List & Report, for the Lower Rio Grande stretch from the international boundary with Mexico upstream to Caballo Reservoir. The USIBWC understands that there were no changes to the assessment information for this stretch since the 2008-2010 report, and that the monitoring schedule for the next assessment cycle is in 2012. The USIBWC is currently a participating entity in the watershed-based plan to address secondary contact impairments in the Lower Rio Grande of New Mexico. We do not have any additional comments on the 20 10-20 12 Integrated List & Report.

SWQB RESPONSE*: Thank you for your review and comment.*

If you have any questions, please feel free to contact me at (915) 832-4767.
Sincerely,

Daniel Borunda
Acting Chief
Environmental Management Division

Electronic cc: Lynette.Guevara@state.nm.us

COMMENT SET 2 – Bernalillo County Public Works, Albuquerque, NM

February 10, 2010

Bernalillo County Public Works
2400 Broadway, S.E.
Albuquerque, NM 87102

Lynette Guevara
NMED SWQB, Room N2163, P.O. Box 5469
Santa Fe, New Mexico, 87502

Re: Draft 2010-2012 Integrated §303(d)/§305(b) Report

Dear Ms. Guevara:

In response to your December 17, 2009 public notice, the Bernalillo County Public Works Division has reviewed the draft 2010-2012 Integrated §303(d)/§305(b) Report and the associated draft Record of Decision (ROD). Following are our comments regarding these documents.

Draft 2010-2012 Record of Decision

The second paragraph in Section I(A) should be slightly revised to reflect the current status of the 2009 Triennial Review of Water Quality Standards. Also in the Section I(A) tabulation of WQS segments not approved by EPA, when describing the impact on the 2010 Integrated List for Segments 20.6.4.98 and 20.6.4.99 (in the third column of the table), NMED appears to have neglected to delete the "aquatic life" designated use that was deemed insufficiently protective by EPA.

SWQB RESPONSE*: As stated in Section I(A), EPA is not anticipated to approve changes to 20.6.4 NMAC as a result of the December 2009 triennial review by April 1, 2010. Therefore, 20.6.4 NMAC as amended through August 1, 2007 are the applicable water quality standards for develop the 2010-2012 Integrated List. SWQB believes it would be confusing to include additional information regarding the status of the 2009 triennial review to this section since the impending outcome is not relevant to the 2010-2012 Integrated List.*

You are correct regarding the "aquatic life" designated use term. These references have been removed for the final draft version.

The introductory paragraphs to Section I(B), describing the Pajarito Plateau special study/assessment notes are difficult to follow, because significant prior knowledge about the special study is presumed of the reader (especially in the third and fourth paragraphs of the section). NMED may wish to rewrite Section I(B) with the objective of providing some additional background about the terminology and study design for readers unfamiliar with the study.

SWQB RESPONSE*: SWQB reviewed this section with this comment in mind and added definitions of terms that may be unfamiliar. While we appreciate that it may be difficult to follow, the purpose of this section is not to provide a complete summary of this study but to provide the relevant details necessary to understand how the assessment was performed. SWQB believes the information in this section and the separate webpage housing information and data related to the Pajarito Plateau study are sufficient for the purpose of the Integrated List.*

In Section I(B)(2), NMED states that it used the congener method (EPA 1668A) to test for PCBs in the Pajarito Plateau special study. It should be noted that the congener method has not been approved by EPA for use in ambient waters (at 40CFR136) and that, as the result of an interlaboratory method validation study, EPA in November 2008 revised the procedure and re-issued it as method 1668B (http://vosemite.epa.gov/water/owrcCatalog.nsf/e673c95b11602f2385256ael007279fe/4432bcflb2fe04f78525754d00665683iOpenDocument). In fact, during the EPA interlaboratory study, half of the participating laboratories were unable to produce results considered usable when analyzing samples with EPA Method 1668A. While we recognize that the use of EPA-approved methods listed on 40CFR136 is not required for water quality assessment, we are somewhat uncomfortable with the use of a method not formally approved by EPA and still subject to revision to determine the PCB content of ambient waters in the Pajarito Plateau special study.

SWQB RESPONSE:
The congener method has been published by EPA's office of research and development, and is therefore an acceptable method pursuant to 20.6.4.14.A(3) NMAC. Also, the congener method is the only method available that has the sensitivity to determine whether or not New Mexico's PCB criteria have been exceeded. These criteria were adopted in accordance with EPA guidance and recommendations. We understand that the congener method is still being refined, as are other EPA methods. We will continue to stay apprised of improvements to the method.

In Section I(B)(3), NMED states that "If the same or comparable analytical methods were used to analyze both LANL and NMED samples from the same storm event, the result with the higher concentration was used for assessment purposes to be conservative in protecting water quality." Given the inherent variability in environmental sampling and analysis, and given that NMED and LANL samples were could well have been collected at different points along the storm hydrograph [see Section I(B)(l), fourth bullet], we are uncomfortable with the NMED practice of routinely selecting the result with the higher concentration for assessment purposes in the Pajarito Plateau special study. At a minimum, a careful review of quality control results from the respective laboratories should be done before a decision is made about which of two conflicting analytical results will be used for assessment purposes.

SWQB RESPONSE: *We acknowledge that the samples may have been pulled from different points along the hydrograph as well as the reasons why in the paragraph preceding Section I(B) (1-4). This paragraph also states that data were considered to be collected from the same storm event when the recorded sample time is generally within sixty minutes. SWQB only considered samples collected during the same hour to be "pseudo-replicates" for assessment purposes. When samples did occur during the same hour, whether it was noted in the Pajarito data set or data sets for anywhere else in the state, it is the documented approach in the Assessment Protocol to use the higher value. We have modified the text in this section to clarify this point. We appreciate your comments regarding alternate approaches and will consider this when the Assessment Protocols are revised.*

We recommend that the last paragraph of Section II and the "Note to the reviewer regarding water quantity related probable sources" following Section V be merged into Section I(C) so that all discussions about changes to Probable Causes of Impairment and Probable Sources of Impairment are located together in the document.

SWQB RESPONSE: *Section I is intended to highlight items specific to the current listing cycle. The following sentence was added to the end of Section I(C) in the Explanatory Notes section of the Integrated List:*

See also below "Note to the reviewer regarding water quantity related probable sources."

Finally, there are several grammatical and typographical errors in the draft ROD that should be corrected after a careful editorial review.

***SWQB RESPONSE**: The ROD is a non-required text document intended to provide EPA and stakeholders with additional information regarding impairment listings. SWQB apologizes for grammatical and typographical errors and will strive to reduce/eliminate them for future listings cycles.*

Draft 2010-2012 Integrated 303(d)/305(b) Report

The introductory language preceding the §303(d)/§305(b) Integrated List in the draft 2010-2012 Integrated Report merely repeats the introductory language from the draft ROD, confusing the reader about which of the two documents is required by EPA. In the 2008-2010 Integrated Report, the §303(d)/§305(b) Integrated List was preceded by language providing significant background information about water quality monitoring and assessment to assist the reader with understanding and interpreting the information provided in the Integrated List. We recommend replacing the introductory language in the draft 2010-2012 Integrated Report with an updated version of the introductory language from the 2008-2010 Integrated Report, and soliciting public review and comment on the updated language.

***SWQB RESPONSE**: SWQB agrees and has revised the Explanatory Notes at the beginning of the 2010 - 2012 Integrated List. It is not necessary to solicit public review and comment on this revision because it is a subset of the information included in the Preface to the 2010-2012 ROD which was available for review and comment during the 60-day comment period.*

While Section II of the draft 2010-2012 Integrated Report states that "the State of New Mexico has prepared an Integrated §303(d)j§305(b) list which includes designated use attainment status for ~ assessed surface waters in the state," there are numerous watersheds that are listed in the table entitled "USGS 8-digit Hydrologic Unit Codes (HUCs) in New Mexico" but for which there is no information in the draft §303(d)/§305(b) Integrated List. Some explanation of the reason(s) for excluding certain watersheds from the §303(d)/§305(b) Integrated List will be helpful to the reader. Also in the third paragraph of Section II, it is stated that "A list of these Category 5 waters is included at the beginning of the draft Integrated List to assist with review." No such list could be located in the draft documents we obtained from the NMED website.

***SWQB RESPONSE**: The watershed map and associated table entitled "USGS 8-digit Hydrologic Unit Codes (HUCs) in New Mexico" includes all 8-digit HUCs in New Mexico and are intended to help the reader locate watersheds of concern. Some HUCs that are not included on the Integrated List contain only ephemeral surface waters which are not routinely sampled by SWQB because they require remote automated samples.*

Regarding the list of Category 5 waters, you are correct. SWQB inadvertently did not include the list of Category 5 waters in the public comment draft Integrated List. It will be included in the final draft Integrated List posted to our website and presented to the WQCC.

In the draft 2010-2012 §303(d)/§305(b) Integrated List, for Assessment Unit ID NM-2105_50 [WQS Reference 20.6.4.105, Rio Grande (Isleta Pueblo bnd to Alameda Bridge)] and for Assessment Unit ID NM-2105.1_00 [WQS Reference 20.6.4.106, Rio Grande (non-pueblo Alameda Bridge to HWY 550 Bridge)], NMED has listed Oxygen, Dissolved as one Probable Cause of Impairment. According to the corresponding sections in the draft ROD (pages 245 and 248), the basis for including dissolved oxygen as a probable cause of impairment is sonde data collected by UNM

graduate student David Van Horn, which "meet SWQB QA/QC requirements according to a review by the SWQB QA Officer." We have reviewed Mr. Van Horn's Quality Assurance Project Plan (QAPP), as referenced in the draft ROD (http://sev.lternet.edu/project details.php?id=SEV190). While the QAPP discusses QA/QC procedures for ambient water samples collected for later analysis at a laboratory, it does not include QA/QC procedures collecting data via an automated sonde deployed unattended for extended periods of time in the field. We are therefore concerned about the use of Mr. Van Horn's sonde data, without independent corroboration and/or independent quality assurance review, to determine that dissolved oxygen is a Probable Cause of Impairment for the middle Rio Grande. Until such time as an appropriate corroborating study and/or independent review can be completed, we request that NMED remove dissolved oxygen as a Probable Cause of Impairment for Assessment Unit ID NM-2105_50 [WQS Reference 20.6.4.105, Rio Grande (Isleta Pueblo bnd to Alameda Bridge)] and for Assessment Unit ID NM-2105.1_00 [WQS Reference 20.6.4.106, Rio Grande (non-pueblo Alameda Bridge to HWY 550 Bridge)].

SWQB RESPONSE*: You are correct. The QAPP on the above-referenced website does not cover the sonde data we assessed. NMED was provided the project Statement of Work which included the sonde QA/QC information. The SWQB QA Officer reviewed this information and found it met NMED requirements and was suitable for use in assessment. This review and associated QA/QC information are included in Attachment A. We have clarified the ROD to state the following:*

> *"The data, metadata, and general project QAPP are on the Sevilleta LTER website: http://sev.lternet.edu/project_details.php?id=SEV190. The SWQB QA Officer reviewed the associated Statement of Work which included QA/QC information specific to the sonde data, and found these data meet SWQB QA/QC requirements."*

In the draft 2010-2012 §303(d)/§305(b) Integrated List, for Assessment Unit ID NM-2105_50 [WQS Reference 20.6.4.105, Rio Grande (Isleta Pueblo bnd to Alameda Bridge)] and for Assessment Unit ID NM-2105.1_00 [WQS Reference 20.6.4.106, Rio Grande (non-pueblo Alameda Bridge to HWY 550 Bridge)], NMED has listed PCBs in Fish Tissue as one Probable Cause of Impairment. According to the Assessment Unit Comments, "The 'PCB in Fish Tissue' listing is based on NM's current fish consumption advisories for this water body." While the issuance by NMDGF, NMDH and NMED, in February 2009, of fish consumption advisories for PCBs in the Rio Grande from 1-25 to US 550 may be adequate justification to establish PCBs as a Probable Cause of Impairment for these Assessment Units, we request that NMED provide explanatory language, perhaps in the ROD, to summarize (or cite a reference to) the data supporting the fish consumption advisory used as the basis for listing PCBs as a Probable Cause of Impairment in the middle Rio Grande.

SWQB RESPONSE*: The below additional information was added to the ROD to address your concern:*

"The fish consumption advisory for PCBs in channel catfish and white bass issued in 2009 is based on data from fish tissue collected 9-10 June 2008 between Bernalillo and Los Padillas. Seven channel catfish, ranging in size from 345 to 440 mm (total length), and 6 white bass, ranging in size from 240 to 260 mm (total length), were composited (keeping species separate) and analyzed for a variety of contaminants, including PCBs. The results from the channel catfish indicated a total PCB concentration of 0.0056 mg/kg (units corrected 08/11/11) and a PCB Toxic Equivalency Quotient (TEQ) of 0.1576 pg/g. The PCB TEQ is a calculated value, based on the sum of the concentrations of the 12 dioxin-like PCB congeners, with each concentration multiplied by an equivalency factor, to represent the toxic equivalency of dioxin. The total PCB result corresponds to a recommendation of ≤ 8 meals per month; the PCB TEQ result corresponds to a recommendation of ≤ 3 meals per month. The results from the white bass indicated a total PCB concentration of 0.1769 mg/kg (units corrected 08/11/11) and a PCB TEQ of

3.1655 pg/g. Both of these results correspond to a recommendation of 0 meals per month. The meals per month recommendation is according to published guidance from the US Environmental Protection Agency (Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 2: Risk Assessment and Fish Consumption Limits, Third Edition, 2000) using cancer risk at a 1 in 100,000 risk level."

Summary

In summary, Bernalillo County is concerned that the use of unapproved and unproven analytical methods, the preferential selection of higher results from comparable analyses, and the use of data produced without a sufficient quality assurance project plan may, in combination, lead to an inaccurate estimate of impairment for water bodies in New Mexico. Identifying impairments to the most accurate extent possible is important because the limited resources available to government entities in New Mexico must be carefully targeted toward those impaired waters and/or pollutants for which the most improvement is needed.

Should you have questions about these comments, please contact me at (505) 848-1507 or at mmurnane@bernco.gov.

Best regards,

Mary Murnane, Manager
Water Resources Program

CC: Tom Zdunek, Deputy County Manager/Public Works Division
Steve Miller, Director, Infrastructure, Planning and Geo-Resources Department

COMMENT SET 3 – Dairy Producers of New Mexico via Glorieta Geoscience, Inc.

February 12, 2010

Ms. Lynette Guevara
NMED Surface Water Quality Bureau
Room N2163
P.O. Box 26110
Santa Fe, New Mexico, 87502
(505) 827-2904

RE: DAIRY PRODUCERS OF NEW MEXICO COMMENTS ON NEW MEXICO ENVIRONMENT DEPARTMENT SURFACE WATER QUALITY BUREAU DRAFT 2010-2012 STATE OF NEW MEXICO INTEGRATED CLEAN WATER ACT SECTIONS 303(D)/ 305(B) LIST OF ASSESSED SURFACE WATERS

Submitted via e-mail to: Lynette.Guevara@state.nm.us

Dear Ms. Guevera:

Dairy Producers of New Mexico (DPNM) represents our member dairies in New Mexico West Texas, and Kansas. DPNM is presenting comments on the New Mexico Environment Department's (NMED) Surface Water quality Bureau's proposed 2010 – 2012 STATE OF NEW MEXICO INTEGRATED CLEAN WATER ACT §303(d)/§305(b) INTEGRATED LIST. DPNM's recognizes that New Mexico, under the Federal Clean Water Act (CWA) §303(d)(1), is required to develop a list of waters within the state that are not supporting their designated uses. A Total Maximum Daily Load (TMDL) will be proposed for each pollutant for those "impaired waters." A TMDL planning document is a written plan and analysis established to restore a waterbody and to ensure that WQS are maintained for that waterbody. Based on data evaluated by NMED, the majority of water quality impairments identified in New Mexico's streams and rivers are due to nonpoint sources of water pollution.

As we proposed in our comments on the Triennial Review, DPNM propose that in addition to assessing water quality in perennial streams, NMED, in association with the regulated community should develop the Hydrology Protocols necessary for field assessment of ephemeral, intermittent, and perennial streams. Field assessment or listing protocols should also be developed for watersheds that have naturally occurring constituents that cause water quality standards to be exceeded.

***SWQB RESPONSE**: As you are aware, SWQB has already drafted a Hydrology Protocol for the determination of perennial, intermittent and ephemeral status of unclassified water. We solicited public comment from the regulated community and stakeholders during a 60-day comment period from August 26, 2009, through October 30, 2009. SWQB appreciates your review and comment dated October 28, 2009, of the draft Hydrology Protocol. Pending the conclusion of the Triennial review SWQB will revise, and take the necessary and appropriate steps to finalize the Hydrology Protocol. As part of the Triennial Review, NMED also proposed guidelines for developing site specific standards based on natural background. If approved, this will provide the mechanism by which NMED and stakeholder groups can address issues related to naturally occurring constituents.*

DPNM reviewed the 2010-2012 State of New Mexico Integrated Clean Water Act §303(d)/§305(b) List and Report. We have specific questions related to the availability and quality of data that resulted in NMED listing Permitted Runoff from Concentrated Animal Feeding Operations (CAFOs)

as a source of E coli that is listed as a probable cause for non-attainment for Secondary Contact in the lower Rio Grande (International Mexico Boundary to Anthony Bridge upstream to the Picacho Bridge).

DPNM is unaware of permitted discharges from CAFOs in the lower Rio Grande and worked closely with Region 6 EPA and the Regional and Albuquerque District offices of the U.S. Fish and Wildlife Service (USFWS) for more than 3 years to develop Best Management Practices (BMPs) that are protective of surface water quality for permitted CAFOs in New Mexico. USFWS researched NMED and EPA databases and neither USFWS nor EPA could provide data showing that permitted (or unpermitted) discharges from New Mexico CAFOs have impaired surface water quality, especially where threatened or endangered species or their habitat exist.

DPNM brought this matter up to NMED in our comments on the 2008-2010 Integrated Clean Water Assessment and they haven't been addressed to date. Once again, DPNM is requesting that NMED provide data that supports an E coli source from permitted discharges from CAFOs.

SWQB RESPONSE: *As stated in previous responses to this concern, the Probable Sources list is intended to include any and all activities that could be contributing to the identified impairment. It is not intended to single out any particular land owner or single land management activity, and has therefore been labeled "Probable" and generally includes several possible items. Probable sources listed for any particular water body have not been proven to be the only source(s) of the identified impairment.*

To address your specific concern, SWQB has changed the Probable Source in these assessment units from "*Permitted Runoff from Concentrated Animal Feeding Operations (CAFOs)" to simply "Concentrated Animal Feeding Operations (CAFOs)" to acknowledge their existence in the watersheds associated with these assessment units.*

Sections 20.6.4.97 (unclassified ephemeral waters), 20.6.4.98 (unclassified intermittent waters), and 20.6.4.99 (unclassified perennial waters) were all not approved by EPA during the 2008-2010 Assessment. For unclassified ephemeral streams, EPA specifically stated "The limited aquatic life and secondary contact uses do not meet the CWA goal of water quality that "provides for the support and propagation of fish, shellfish and wildlife and recreation in and on the water." For unclassified intermittent streams EPA specifically stated "The general "aquatic life" use does not provide sufficient protection, and the secondary contact use cannot be assigned without a UAA. For unclassified perennial streams, the EPA specifically stated "The general "aquatic life" use does not provide sufficient protection, and the "secondary contact" use cannot be assigned without a UAA."

Although no UAAs have been performed, NMED has "upgraded" WQS stream designations. A use attainability analysis (UAA) must demonstrate that the goal cannot be attained before the assigned uses can be applied. No UAAs have been submitted with the proposed assessments and a WQS should not be assigned until UAAs are conducted. No UAA can be conducted until NMED develops its Hydrology Protocols and puts the protocols out to public comment. Therefore, DPNM requests that all modifications of WQS that are subject to UAAs be removed from the Assessment.

SWQB RESPONSE: *It is true that EPA did not approve the limited aquatic life, aquatic life and secondary contact designated uses adopted by the WQCC for unclassified waters (Sections 20.6.4.97 – 99) in 2005. In withholding approval, EPA stated that it "presumes that CWA Section 101(a)(2) uses are attainable for all unclassified ephemeral, intermittent and perennial surface waters of the State, until additional supporting documentation is provided to demonstrate that CWA Section 101(a)(2) uses are not attainable." (EPA Record of Decision, December 29, 2006, p. 42.) Any party at any time may conduct a UAA in order to assess whether these Section 101(a)(2) uses*

are attainable on a particular unclassified water. If they are not, then the WQCC may change the WQS through a rulemaking, and submit the revised WQS for EPA approval. In the meantime, Section 101(a)(2) uses apply for CWA purposes requiring EPA approval such as this 305(b)/303(d) Integrated Report and List. EPA has agreed that the primary contact use and the marginal warmwater (for nonperennial waters) and warmwater (for perennial waters) aquatic life uses meet the Section 101(a)(2) goals, so NMED has applied these uses in this Integrated List.

Please contact either me via email at lazarus@glorietageo.com or at 983-5446 x111 or Sharon Lombardi, Executive Director, DPNM (1-800-217-2687) with any questions or comments.

Sincerely,
Jay Lazarus
Pres./Sr. Geohydrologist

xc: Sharon Lombardi, Executive Director, DPNM

COMMENT SET 4 -- Mid Rio Grande Stormwater Quality Team, Albuquerque. NM

STORMWATER QUALITY TEAM PARTNERS
Albuquerque Metropolitan Arroyo food Control Authority • Bernalillo County
City of Albuquerque • Ciudad Soil & Water Conservation District • NM Department of Transportation
Southern Sandoval County Arroyo Flood Control Authority • University of New Mexico
www.keeptheriograng.org

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February 10, 2010

Lynette Guevara
New Mexico Environment Department
1190 S. St. Francis Drive
P.O. Box 5469
Santa Fe, NM 87502

Re: Comment on Proposed 303d/305b Impaired Waters Listings

Dear Ms. Guevara:

The Mid Rio Grande Stormwater Quality Team is concerned about the proposed impairment listings (and perhaps de-listings) in the pending 303d/305 b Impaired Waters List. Impairment listings result in TMDLs that may result in costly NPDES permit requirements. Agencies may have difficulty complying with such requirements, especially in the current economic downturn. Trying to correct river problems for which we may have no contribution or ability to control is wasteful of taxpayer money.

GENERAL CONCERN
We collectively remain concerned regarding the paucity and representativeness of the data that were relied upon to make the pending weighty/costly impairment determinations. Regarding the pending E.coli TMDL, we offered to more comprehensively monitor the Rio Grande River in the ABQ metro area reaches before establishing the new TMDL. Unfortunately, our offer was rejected by the NMED Surface Water Quality Bureau. However, when we had met with the NMED on this issue on 1-21-10, the NMED representative mentioned that the Rio Grande upstream from the Highway 550 bridge to Angostura Diversion (AU ID: NM-2105.1_02) is no longer listed as impaired due the "high intensity" sampling and monitoring that occurred in that reach in 2005. Based on the draft 2010-2012 integrated 303(d)-305(b) Report "high intensity" sampling was actually only 13 samples taken over a 5-year period with one exceedance noted. Additionally, the Isleta to Alameda reach (AU Id: NM-2105_50) was only sampled 20 times over a 5-year period with 4 exceedances noted. We are adamantly opposed to the use of such inadequate data for either a listing or a de-listing of a perceived impairment.

SWQB RESPONSE: *The above statement regarding the 1/21/10 meeting does not accurately represent the discussions between SWQB and MRG Stormwater Quality Team (SQT). As discussed at the 1/21/10 meeting and stated in our 02/01/10 letter, SWQB encourages the SQT to*

undertake water quality sampling efforts in the Middle Rio Grande and would welcome this data contribution to the next assessment cycle. NMED only rejected the delay in the TMDL pending this data collection, not data collection by the MRG team. Please see a copy of NMEDs letter provided in the response to comments of the Middle Rio Grande TMDL for additional details.

SWQB is charged with sampling surface water quality of the entire state of New Mexico. As such, our current resources allow for an approximately 8-year rotational watershed survey schedule. The amount of data mentioned above for the Middle Rio Grande is adequate for assessment and listing purposes according to EPA guidance, and generally speaking does contain more stations per assessment unit and more samples per station than most other areas in the State. EPA does not recommend a minimum sampling (see below excerpt from our Assessment Protocol available at: ftp://ftp.nmenv.state.nm.us/www/swqb/MAS/Protocols/AssessmentProtocol.pdf):

> *"USEPA does not recommend the use of rigid, across the board, minimum sample size requirements in the assessment process (USEPA 2009). Target sample sizes should not be applied in an assessment methodology as absolute exclusionary rules (USEPA 2003, 2005). The use of limited data sets is acceptable to USEPA as limited financial, field, and laboratory resources often dictate the number of samples that can be collected and analyzed (USEPA 2002a)."*

With regards to the E. coli listing for the assessment unit "Rio Grande (Isleta Pueblo bnd to Alameda Bridge)," 4 of 20 exceedences represents a 20% exceedence rate of the applicable single sample criterion of 410 cfu/100 mL. These exceedence values of 1000, 1000, 730, and 1553 cfu/100 mL were well above the applicable criterion. Assessment of this available data set is adequate to determine the stated E. coli impairment per available EPA listing guidance. It is also noteworthy that 9 of 20 samples (45%) exceeded the monthly geometric mean criteria of 126 cfu/100 mL.

The general goals of the Clean Water Act are to make all natural waters swimmable and fishable. In New Mexico naturally occurring contamination sources are likely the main contributors to the impairments listed except for PCBs in fish tissues. PCBs are now ubiquitous world-wide with macrobiota being contaminated even in the remote reaches of the arctic. PCBs are transported into pristine environments by wind, water currents, bioaccumulation, and wildlife migration with no local anthropogenic contributions.

***SWQB RESPONSE**: NMED recognizes that there are natural sources of pollutants and has acknowledged this in the probable source list by including "Avian Sources (waterfowl and/or other)." We also recognize that atmospheric deposition of pollutants such as PCBs and mercury has resulted in the widespread dispersal of these contaminants. Please note that atmospheric deposition of pollutants is not a natural source or background issue – rather it is a diffuse anthropogenic source. NMED welcomes stakeholder and public input on probable source issues and has recently developed a new web page devote to increase input into probable source lists (please see http://www.nmenv.state.nm.us/swqb/PS/).*

In addition to our general concerns above, we also concur with the comments expressed by Mary Murnane, Water Resources Manager, Bernalillo County Public Works Division.

***SWQB RESPONSE**: Please see Comment Set 2 above.*

Please contact Vern Hershberger at (505) 277-9456 or at hershber@unm.edu and/or Kevin Daggett at (505) 884-2215 or at kdaggett@amafca.org to discuss our comments.

Sincerely,

Vern Hershberger, SQT Chairman
UNM Environmental Health Mgr.

Kevin Daggett, SQT Fiscal Agent Rep.
Environmental Engineer, AMAFCA

Roland Penttila, P.E.
Supervisor; Stormwater Management Section
City of Albuquerque

Kathy Trujillo
Assistant District 3 Engineer
Maintenance, NMDOT

Dr. Mark T. Murphy
Supervisor, Cuidad Soil & Water Conservation District

CC: SQT Member Agencies

COMMENT SET 5 – Concerned Citizens for Nuclear Safety, Santa Fe, NM

From: Joni Arends [mailto:jarends@nuclearactive.org]
Sent: Tuesday, February 16, 2010 1:29 PM
To: Guevara, Lynette, NMENV
Subject: Public Comments d 2010-2012 CWA Integrated 303(d) Pollutant List

February 16, 2010

By email to: lynette.guevara@state.nm.us

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and
Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms. Guevara:

Concerned Citizens for Nuclear Safety (CCNS), a Santa Fe based non-governmental organization, provides the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

We commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. We are concerned that acute standards were used rather than the more protective chronic standards. The analyses that were done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

SWQB RESPONSE*: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

We are concerned about the transport of toxic, hazardous and radioactive contaminants through the canyons. And we know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

Because many members of CCNS live downstream from these canyons, we are concerned about the safety of the drinking water that will be diverted from the Rio Grande through the soon-to-be completed Buckman Direct Diversion Project.

***SWQB RESPONSE**: As part of the public comment draft of the 303d list, NMED electronically released all data used for assessment of waters from the Pajarito Plateau. This dataset provides stakeholders and citizens the opportunity to and evaluate the water quality of these streams.*

NMED will continue to work with the City of Santa Fe to ensure the safety of drinking water diverted from the Rio Grande.

Therefore, CCNS requests that the:

1. analyses be redone using the more protective water quality standards;

***SWQB RESPONSE**: Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

***SWQB RESPONSE**: Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

***SWQB RESPONSE**: NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

Thank you for your consideration of our comments. Please contact me with any questions or comments.

Sincerely,

Joni Arends, Executive Director
Concerned Citizens for Nuclear Safety
107 Cienega Street
Santa Fe, New Mexico 87501

COMMENT SET 6 – Honor Our Pueblo Existence (HOPE), Espanola, NM

February 16, 2010

By email to: lynette.guevara@state.nm.us

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms. Guevara:

I make the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

I commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. I am concerned that acute standards were used rather than the more protective chronic standards. The analysis that was done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

***SWQB RESPONSE**: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

Because I live in this watershed and I have family members downstream, I am concerned about the safety of drinking water from the Buckman Direct Diversion Project, the water used for irrigating crops from the Rio Grande, and the water that is consumed by the wild game that we hunt and eat.

***SWQB RESPONSE**: As part of the public comment draft of the 303d list, NMED electronically released all data used for assessment of waters from the Pajarito Plateau. This dataset provides*

stakeholders and citizens the opportunity to and evaluate the water quality of these streams.

NMED will continue to work with the City of Santa Fe to ensure the safety of drinking water diverted from the Rio Grande. Several mechanisms will be in place, such as only withdrawing water during non-storm flows, to address concerns regarding potential runoff from upstream land uses. SWQB also assesses available Rio Grande water quality data to determine and report any potential impairments to applicable designated and existing uses, including irrigation and wildlife habitat uses.

Nevertheless, we do know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

I request that the:

1. analyses be redone using the more protective water quality standards;

SWQB RESPONSE*: Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

SWQB RESPONSE*: Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

SWQB RESPONSE*: NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

If you have any questions feel free to contact me at the information provided below.

Sincerely,

Marian Naranjo

Honor Our Pueblo Existence (HOPE)
RT. 5 Box 474 Espanola, New Mexico 87532
Phone: 505 747-4652
e-mail: mariann2@windsteam.net

COMMENT SET 7 – Sawnie Morris, Ranchos de Taos, NM

From: Sawnie Morris
Sent: Tuesday, February 16, 2010 12:55 PM
To: Guevara, Lynette, NMENV
Subject: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds Los Alamos National Laboratory

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms. Guevara:

I make the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

I commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. I am concerned that acute standards were used rather than the more protective chronic standards. The analysis that was done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

***SWQB RESPONSE**: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

Nevertheless, we do know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of

pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

I request that the:

1. Analyses be redone using the more protective water quality standards;

SWQB RESPONSE: *Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. Development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards.

Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

SWQB RESPONSE: *Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

SWQB RESPONSE: *NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

Please contact me with any questions or comments.

Sincerely,
Sawnie Morris

COMMENT SET 8 – Loretto Community, NM Justice and Peace Coordinator, Santa Fe, NM

From: penny mcmullen
Sent: Tuesday, February 16, 2010 2:14 PM
To: Guevara, Lynette, NMENV
Subject: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List

Feb. 16, 2010

By email to: lynette.guevara@state.nm.us

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms. Guevara:

The Loretto Community of Sisters and Comembers, a national non-governmental organization, provides the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

We commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. We are concerned that acute standards were used rather than the more protective chronic standards. The analyses that were done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

***SWQB RESPONSE**: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

We are concerned about the transport of toxic, hazardous and radioactive contaminants through the canyons. And we know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

Because the Loretto Community has been serving the people of New Mexico for 157 years, we are concerned about the safety of the drinking water that will be diverted from the Rio Grande through the soon-to-be completed Buckman Direct Diversion Project.

***SWQB RESPONSE**: As part of the public comment draft of the 303d list, NMED electronically released all data used for assessment of waters from the Pajarito Plateau. This dataset provides stakeholders and citizens the opportunity to and evaluate the water quality of these streams.*

NMED will continue to work with the City of Santa Fe to ensure the safety of drinking water diverted from the Rio Grande.

Therefore, the Loretto Community requests that:

1. the analyses be redone using the more protective water quality standards;

***SWQB RESPONSE**: Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. the development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

***SWQB RESPONSE**: Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. the NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

***SWQB RESPONSE**: NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

Thank you for your consideration of our comments.

Sincerely,

Penelope McMullen, SL
NM Justice and Peace Coordinator
Loretto Community
113 Camino Santiago
Santa Fe, NM 87501

COMMENT SET 9 – Virginia J Miller, Santa Fe, NM

From: Virginia J Miller
Sent: Tuesday, February 16, 2010 5:09 PM
To: Guevara, Lynette, NMENV
Subject: Public Comments about Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List...

February 16, 2010

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and
Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds
Los Alamos National Laboratory

Dear Ms. Guevara:

I make the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

I commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

I am concerned about the transport of radioactive, toxic and hazardous contaminants through the canyons. And we know that even using the weaker standards, 22 of the 23 water bodies on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

Because I live downstream from many of these canyons, in Santa Fe, I am concerned about the safety of drinking water that will be diverted from the Rio Grande through the soon-to-be-completed Buckman Direct Diversion Project. **A clean water supply means life and health!**

SWQB RESPONSE: *As part of the public comment draft of the 303d list, NMED electronically released all data used for assessment of waters from the Pajarito Plateau. This dataset provides stakeholders and citizens the opportunity to and evaluate the water quality of these streams.*

NMED will continue to work with the City of Santa Fe to ensure the safety of drinking water diverted from the Rio Grande. Several mechanisms will be in place, such as only withdrawing water during non-storm flows, to address concerns regarding potential runoff from upstream land uses.

Therefore, I request that the:

1. analysis be redone using the more protective water quality standards;

SWQB RESPONSE*: Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

SWQB RESPONSE*: Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters. **Water is precious to all life! Clean up LANL.**

SWQB RESPONSE*: NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

Thank you for your consideration of my comments. Please contact me with any questions or comments.

Sincerely,

Virginia J. Miller

COMMENT SET 10 – Lesley Weinstock for Agua es Vida Action Team (AVAT), Albuquerque, NM

From: Lesley Weinstock
Sent: Tuesday, February 16, 2010 8:21 PM
To: Guevara, Lynette, NMENV
Subject: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

February 16, 2010
Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and
Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms. Guevara:

I make the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

I commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. I am concerned that acute standards were used rather than the more protective chronic standards. The analysis that was done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

SWQB RESPONSE*: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

I am concerned about the transport of radioactive, toxic and hazardous contaminants through the canyons. And we know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

Because I live downstream from many of these canyons, I am concerned about the safety of Abq drinking water that is now diverted from the Rio Grande through the San Juan Chama Diversion Project.

Therefore, I request that the:

1. analysis be redone using the more protective water quality standards;

***SWQB RESPONSE**: Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

***SWQB RESPONSE**: Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

***SWQB RESPONSE**: NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

Thank you for your consideration of my comments. Please contact me with any questions or comments.

Sincerely,

Lesley Weinstock

From: Lesley Weinstock
Sent: Tuesday, February 16, 2010 8:34 PM
To: Guevara, Lynette, NMENV
Subject: Addendum: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms Guevara,

My letter represents 250 members of Agua es Vida Action Team (AVAT), a nonprofit, citizen action group in Abq, concerned with safeguarding our tap water, since it is coming from the Rio Grande. Thank you for your consideration.

Sincerely,
Lesley Weinstock, Co-coordinator
AVAT

COMMENT SET 11 – Tewa Women United, Santa Cruz, NM

Tewa Women United
P.O. Box 397
Santa Cruz, NM 87567
505 747 3259 phone
505 7474067 fax

February 17, 2010

By email to:lynette.guevara@state.nm.us

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds - Los Alamos National Laboratory

Dear Ms. Guevara:

I make the following public comments about the Draft 2010- 2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

I commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d) / 305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. I am concerned that acute standards were used rather than the more protective chronic standards. The analysis that was done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

***SWQB RESPONSE**: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

Because I and my relatives live downstream from many of these canyons, I am Deeply concerned about the safety of drinking water from our wells and from the Buckman Direct Diversion Project.

SWQB RESPONSE: *As part of the public comment draft of the 303d list, NMED electronically released all data used for assessment of waters from the Pajarito Plateau. This dataset provides stakeholders and citizens the opportunity to and evaluate the water quality of these streams.*

NMED will continue to work with the City of Santa Fe to ensure the safety of drinking water diverted from the Rio Grande.

Nevertheless, we do know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

I request that the:

1. analyses be redone using the more protective water quality standards;

SWQB RESPONSE: *Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

SWQB RESPONSE: *Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

SWQB RESPONSE: *NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

You are our hope towards wellness restored as it was before LANL came to our sacred mountain watershed.

SWQB RESPONSE: *SWQB staff take the responsibility to protect the limited surface water resources in New Mexico seriously, and will continue to do what we can to protect and restore these waters.*

Please contact me with any questions or comments.

Sincerely,
Kathy Wan Povi Sanchez, Co-Director

COMMENT SET 12 – Citizen Action New Mexico, Albuquerque, NM

From: Dave McCoy [mailto:dave@radfreenm.org]
Sent: Tuesday, February 16, 2010 4:38 PM
To: Guevara, Lynette, NMENV
Subject: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds - Los Alamos National Laboratory

February 16, 2010

By Email to: lynette.guevara@state.nm.us

Ms. Lynette Guevara
Surface Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Re: Public Comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List and Comprehensive Water Quality Assessment of the Pajarito Plateau Watersheds – Los Alamos National Laboratory

Dear Ms. Guevara:

CITIZEN ACTION, an Albuquerque based non-governmental organization, provides the following public comments about the Draft 2010-2012 Clean Water Act Integrated 303(d) Pollutant List for the Pajarito Plateau Watersheds, where Los Alamos National Laboratory (LANL) is located.

We commend the New Mexico Environment Department (NMED) for conducting a comprehensive study of the Pajarito Plateau Watersheds as part of the Clean Water Act 303(d)/305(b) Report.

Unfortunately, the wrong criteria were used for assessing impairment in most of the waters on LANL property. The aquatic life standards that were used for the intermittent streams on LANL property are weaker than those used for almost any other water body in New Mexico. The only other water body with as weak of standards is Sulpher Creek, a stream with naturally occurring high levels of metals. We are concerned that acute standards were used rather than the more protective chronic standards. The analyses that were done to justify the use of the weak standards being applied to the Pajarito Plateau waters was flawed. Further, it was not sent out for public comment as required by law.

SWQB RESPONSE*: EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concerns have been provided to SWQB's Standards and Reporting Team.*

Citizen Action is concerned that an adequate human health and ecological risk assessment has not been performed for Pajarito Canyon. The November 4, 2008 AQS *Comments on the Pajarito*

Canyon Investigation Report, Los Alamos National Laboratory (DCN:NMED-2008-014) state that:

> "The [human health risk] assessment does not include a cumulative assessment of risk to a receptor exposed to multiple areas within the canyon. In addition, it appears that for the recreational receptor, separate risks were evaluated to surface water and sediments, but a cumulative risk was not determined."
>
> "Volatile organic compounds (VOCs) were not evaluated in the assessment; the rationale being that VOCs do not represent a significant pathway. … VOCs can represent a potentially significant exposure pathway to wildlife through the inhalation of contaminated subsurface burrow air."

Because NMED used the weaker and less protective standards in developing the list of polluted waters (303d list), we don't know the true extent of the pollution in these waters.

We are concerned about the transport of toxic, hazardous and radioactive contaminants through the canyons. And we know that even using the weaker standards, 22 of the 23 water bodies assessed on LANL property were listed as not meeting water quality standards. A wide range of pollutants exceeded the weaker standards, including PCBs, gross alpha radiation, copper, aluminum and mercury.

Many members of CITIZEN ACTION live downstream from these canyons that are contaminating the Rio Grande. We are concerned about the safety of the drinking water that will be diverted for the Rio Chama and Rio Grand Diversion Projects.

Therefore, CITIZEN ACTION requests that the:

1. Analyses be redone using the more protective water quality standards;

SWQB RESPONSE: *Please see above response. The correct water quality standards were used per 20.6.4 NMAC as amended through August 1, 2007.*

2. Development of Total Maximum Daily Load (TMDLs) for the Pajarito Plateau begin now. A TMDL is a calculation of the maximum amount of a pollutant that waters may receive and still meet water quality standards. Given that 22 of the 23 waters are out of compliance, this effort needs to be done now on a strict schedule; and

SWQB RESPONSE: *Development of these TMDLs will begin as soon as possible following the approval of the impairment listings in the final draft 2010-2012 Integrated List by the New Mexico Water Quality Commission and EPA Region 6. Proposed standards changes during the recent triennial review may require re-assessment of some metals such as aluminum prior to TMDL development to determine if the impairment status has changed.*

3. An adequate assessment of human health and ecological risk be performed for Pajarito Plateau from all contaminants including cumulative analyses.

SWQB RESPONSE: *The Integrated Listing process requires determination of impairment due to individual parameters for which there are water quality criteria adopted by the WQCC. Ecological risk assessment is not a required or relevant process for determining our Clean Water Act list of impaired surface waters.*

4. NMED and the Environmental Protection Agency take broad enforcement action in order to protect our waters.

SWQB RESPONSE: *NMED and EPA will continue to work with stakeholders and the regulated community to protect our waters through the Clean Water Act and the New Mexico Water Quality Act.*

5. That meaningful opportunity for public participation be provided by furnishing all documents as part of the record in this matter for the public, including those by contractors such as AQS and TechLaw, Inc.

SWQB RESPONSE: *The public participation requirement for potential revisions to the water quality standards found at 20.6.4.128 NMAC was fulfilled through the opportunity to provide testimony and/or public comment at the 2005 triennial review when this water quality standard segment was first proposed, as well as at the December 2009 triennial review. Your concerns have been provided to the SWQB Standards and Reporting Team.*

Thank you for your consideration of our comments. Please contact me with any questions or comments.

Sincerely,

David B. McCoy, Executive Director
Citizen Action New Mexico
POB 4276
Albuquerque, NM 87196-4276
505 262-1862
dave@radfreenm.org

COMMENT SET 13 – Amigos Bravos, Taos, NM

Amigos Bravos
Friends of the Wild Rivers
P.O. Box 238, Taos, NM 87571
Telephone: 505.758.3474
Fax: 505.758.7345

February 16, 2010

Lynette Guevara
NMED SWQB, Room N2163
P.O. Box 26110
Santa Fe, NM 87502
lynette.guevara@state.nm.us.

Via Electronic Mail: lynette.guevara@state.nm.us

RE: Draft 2010-2012 303(d)/305(b) Integrated List

Dear Ms. Guevara,

Amigos Bravos is a statewide river conservation organization guided by social justice principles. Our mission is to protect and restore the rivers of New Mexico, and ensure that those rivers provide a reliable source of clean water to the communities and farmers that depend on them, as well as a safe place to swim, fish, and go boating. Amigos Bravos works locally, statewide and nationally to ensure that the waters of New Mexico are protected by the best policy and regulations possible. In this capacity Amigos Bravos works to make sure that New Mexico's water quality standards are protective enough to support the diverse human and non-human uses of our state's water resources. The 303(d)/305(b) list is a critical component of our work to protect clean water and the cultures that depend upon clean water here in New Mexico. We would like to communicate the following comments and concerns regarding the draft 2010-2012 integrated list.

E.Coli Data – Rio Fernando, Rio Hondo, Rio Pueblo de Taos

Amigos Bravos along with Sentinels – Rios de Taos have been collecting water quality data in the Rio Fernando, Rio Pueblo de Taos, and Rio Hondo for several years. Monitoring results have shown E.coli exceedances in all three of these streams. Reports that summarize these findings have been submitted to the Surface Water Quality Bureau but most of the data contained in those reports have not been used in the development of the draft list. The assessment sheets for these streams state "Amigos Bravos submitted data for the 2010 listing cycle. The only E. coli data that met SWQB QA/QC requirements for assessment were from 12/3/07 and 3/10/08 because these data met the required 6-hour holding time according to the submitted sampling plan." The 12/3/07 and the 3/10/08 E.coli samples were analyzed by NMED staff using the IDEXX bacteria enumeration system and thus a 6-hour holding time was followed. All other samples were analyzed using EPA method 10029 by Sangre de Cristo Laboratories. Both Sangre de Cristo laboratories and EPA documents specify that a holding time of 24 hours (for Sangre de Cristo[1]) or 30 hours (EPA documentation[2]) should apply when using method 10029. Both reports and associated data for

[1] The QAAP for the Amigos Bravos/Water Sentinels sampling is found in appendix B of attached report. It details a 24 hour holding time for E.coli samples as required by Sangre de Cristo labs.
[2] EPA documentation indicates that 30 hours is the maximum holding time when using method 10029. EPA documents entitled "Analytical Methods Approved for Drinking Water Compliance Monitoring under the Total Coliform Rule" and "Total Coliforms and E. coli Membrane Filtration Method" are attached to these comments. Both of these documents indicate a 30 hour holding time is appropriate when using EPA method 10029.

those reports are attached to these comments. Since a holding time of 24 hours was more than followed in the Amigos Bravos/Water Sentinels sampling events, this data should be used for assessment decisions in the 2010-2012 list. AU NM 2120A._512 (lower portion of the Rio Fernando) at the very least should be listed as not supporting Secondary Contact (although the segment specific criteria of 126 cfu/100ml for the monthly mean and the 235 cfu/100ml for single sample should be used in making this assessment) with the E.coli listed as the source of impairment. In addition, it may be appropriate to list NM2120.A_511 and NM212.A_600 (lower portions of the Rio Pueblo de Taos and Rio Hondo) as impaired with E.coli as well.

SWQB RESPONSE: *SWQB has reviewed the attachments provided by Amigos Bravos and notes the following regarding EPA method 10029:*

A. Method 10029 is a drinking water method to determine the presence or absence of total coliform and E. Coli, not the quantification of E. Coli in ambient/non-potable water as needed for assessment. Specifically, section 1.1 of the method states "This method determines the presence or absence of total coliforms and E. coli in finished potable water using a selective and differential membrane filtration (MF) medium, m-ColiBlue24 Broth."
B. Method 10029 does provide holding time guidance for non-potable waters. Specifically, section 8.3 states "Preservation, Shipment, Storage - … Non-potable samples should be held at <10°C for a maximum period of 8 hours from sampling to analysis."
C. In reviewing the EPA method 10029, SWQB found that it is the same method as EPA Method 1603 listed in 40CFR136.3 as an approved method for ambient/non-potable waters. This method specifies the following: "…sample analysis should begin immediately, preferably within 2 hours of collection. The maximum transport time to the laboratory in 6 hours, and samples should be processed within 2 hours of receipt at the laboratory." This 6+2 hour holding time is consistent with that reported for non-potable waters in EPA method 10029.

In summary, the application of method 10029, specifically the 30-hour hold time, is only suitable for drinking water and not ambient/non-potable water. This is consistent with the conclusion reach by SWQB's QA review provided in Attachment B and as such these data are not suitable for assessment purposes.

SWQB brought this issue to Amigos Bravos attention during the 2008 listing cycle as well, and has offered to work with Amigos Bravos and Sentinels – Rios de Taos to help analyze samples using methods suitable for SWQB's water quality assessment. SWQB repeats this offer as we would like to see more water quality data collected by local governments, stakeholders, researchers and citizens used in the assessment process. However, SWQB must ensure that these data meet appropriate QA/QC requirements for use in evaluating New Mexico's water quality.

PCBs in Fish Tissue

Amigos Bravos is concerned that no TMDL schedule has be identified for the dozen or so waters listed as impaired with PCBs in Fish Tissue. NMED should set TMDL schedules for these waters so that these impairments can begin to be addressed.

SWQB RESPONSE: *SWQB does not have the staff or financial resources to develop TMDLs for PCBs in Fish Tissue at this time.*

Pajarito Plateau

Amigos Bravos continues to be very concerned about the UAA that was conducted for intermittent and ephemeral waters on LANL property (20.6.4.128 NMAC). Amigos Bravos believes that this was

a faulty document that did not present accurate information. In addition, proper public notice and comment procedures were not followed for this UAA. Specifically the UAA relied primarily on the USFWS document, Lusk and MacRae, 2002 for the UAA. This document specifically recommends an upgrading of water quality standards to coldwater aquatic life, yet the UAA uses it as a justification to downgrade the use from aquatic life to limited aquatic life. Of the 12 drainages in this segment only 3 were examined by the USFWS and are mentioned in the USFWS report. The UAA does not present any additional data besides the USFWS report and therefore only presents data on 3 of the 12 drainages (the study looks at 4 intermittent streams in Los Alamos County, but one of those streams is located upstream from LANL and is not included in 20.6.4.128). As mentioned above, the data on these 3 streams that USFWS present led the USFWS on page 90 of their Report to conclude that: "Since all these intermittent streams contained aquatic life, a coldwater fishery was considered an existing use and should be considered for State designation"

This issue was addressed in 2004 Triennial Review, yet Amigos Bravos does not find any justification in either the transcripts of the hearing nor the final WQCC statement of reason as to why the limited aquatic life was appropriate and adopted. In fact one finds quite the contrary, the Department in the form of testimony from John Montgomery on page 67 line 2- 23 of the transcripts stated that while originally, prior to reviewing the USFWS data, the department did not oppose the chronic criteria for the limited aquatic life use (the use that is applied to 20.6.4.128) they didn't have enough data to support such as designation. Yet, after reviewing the data and testimony from USFWS the Department believed that: "It is appropriate to apply the chronic life criteria to these waters. The Bureau's Aquatic Biology and Physcial Habitat Team has reviewed the US Fish and Wildlife Service information and concludes that there is substantial scientific evidence to support the application of chronic criteria in these waters."

On Page 164 of the transcripts Mr. Montgomery goes on to say "As we have previously discussed, LANL's contention that coldwater aquatic life cannot be assigned without fish has no basis because the presence or absence of a specific life form is not determinative." Yet the UAA that was conducted by the Department to justify the Commissions decision to apply limited aquatic life (acute criteria only) to this segment states that "[s]upport of a fishable use in these types of waters would require a source population of fish that could enter and occupy these waters during wet periods." The USEPA and the USFWS agree with Mr. Montgomery that aquatic life is more than the presence or absence of fish as stated on page 89 of the 2002 USFWS report: "An existing aquatic life community composed entirely of invertebrates and plants, such as may be found in a pristine alpine tributary stream, should still be protected whether or not such a stream supports a fishery (USEPA 1995b). Therefore, a fishery is more than just a fish in the water; it is the biological, chemical, and physical characteristics of a water body, including the invertebrate community and all the other aquatic life forms that provide food as well as other ecosystem functions and services."

The WQCC, in their final statement of reason for the 2004 Triennial Review gives the following reason for adopting the uses for segment 20.6.4.128:

> 243. The Commission adopts another new segment proposed by NMED and UC, for the same reasons as set out above in paragraphs 235-236. The proposed uses are appropriate, as discussed above.
> 244. The Commission adopts UC's proposed acute total ammonia criteria for this segment in order to identify the applicable criteria.

Yet, when one goes to paragraphs 235-236 one finds the justification for applying the coldwater aquatic life use, not the limited aquatic life use:

> 235. Both UC and NMED proposed to segment and adopt segment-specific standards for waters within or near LANL. The segments, set out now as segments 126, 127 and 128, are identical, but different designated uses and criteria were urged in this segment.

236. The Commission adopts this new segment to classify waters based upon an intensive study by the USFWS. The study supports the designated uses of coldwater aquatic life, wildlife habitat, secondary contact, and livestock watering. The aquatic life, wildlife habitat and recreation uses are required by CWA Section 101(a)(2) unless a UAA supports not designating them. For this segment, coldwater is the appropriate subcategory of aquatic life use because it is supported by the USFWS report and is consistent with the aquatic life use in adjacent Section 20.6.4.121, which includes tributaries of the Rio Grande in Bandelier National Monument (where high quality coldwater is the designated use). For this segment, secondary contact is the appropriate subcategory of recreation because full-body contact in these small streams is unlikely and infrequent, and if it does occur the proposed criteria offer a proper level of protection. Finally, the uses of wildlife habitat and livestock watering are appropriate. The WQCC has historically presumed these uses for all unclassified surface waters. There is no question about wildlife using these streams. There also is evidence that livestock watering is an existing use. Laboratory publications acknowledge the presence of livestock on or adjacent to this segment, including horseback riding, cattle grazing and free-range chickens and dairy goats. The designation of livestock watering is based on both the existing use of these waters by livestock, as well as for the protection of downstream livestock watering uses.

In addition, the Commission specifically rejects UC's proposal to designate just limited aquatic life to segment 20.6.4.126 for the following reasons:

237. The Commission rejects UC's proposal to designate just limited aquatic life because USFWS demonstrated that shellfish typically found in coldwater aquatic communities is present in these streams. The coldwater subcategory is intended for "the protection and propagation of fish, shellfish and wildlife." Accordingly, the presence of shellfish indicative of a coldwater aquatic community establishes an existing use, even in the absence of fish. In addition, the USFWS documented existing macroinvertebrate communities in all of these streams (except Water Canyon). These macroinvertebrate communities (except Sandia Canyon) compare favorably (only slightly impaired or full support - impacts observed) to Upper Los Alamos Canyon, a coldwater fishery at the time of the study. The USFWS also determined that eight species in Los Alamos and Pajarito Canyons (identified by NMED) were classified by the Idaho Department of Environmental Quality (DEQ) as preferring coldwater. Moreover, the Laboratory's invertebrate data included several species that prefer coldwater in Los Alamos, Pajarito, Sandia and Chaquehui Canyons. Finally, to the extent that the absence of fish is relevant to the subcategory designation, the term "existing use" has a broader meaning than "existing on this date". The absence of fish in 2003 is not the benchmark for designation of an aquatic life use.

The existing use by shellfish is not even mentioned in the UAA yet the protection of shellfish is a 101(a)(2) and CWA Regulations specifically say that States must provide water quality for the protection and propagation of fish, shellfish, and wildlife. 40CFR131.3(f). In fact this same USFWS report cites current occurrence of shellfish (ridged-beak peaclams) in Frijoles, Pajarito, Water and Los Alamos Canyons (citing Cross 1996b).

In conclusion, Amigos Bravos does not believe that the correct standards were used to assess the intermittent and ephemeral stream on LANL property. Both acute and chronic criteria should apply to these streams segments.

***SWQB RESPONSE**: The above concerns regarding 20.6.4.128 NMAC were discussed in front of the New Mexico Water Quality Control Commission at the December 2009 triennial. Please refer to http://www.nmenv.state.nm.us/swqb/Standards/ for information regarding the water quality standards and resolution to this concern.*

EPA requires that the most current, EPA-approved water quality standards be used to develop the Integrated List. Water quality segment 20.6.4.128 NMAC assigning livestock watering, wildlife habitat, limited aquatic life and secondary contact uses and specifying associated criteria was approved by both the New Mexico Water Quality Control Commission and EPA Region 6. Therefore, the correct criteria were used to assess ephemeral and intermittent streams on LANL property according to 20.6.4 NMAC as amended through August 1, 2007. Your concern has been provided to SWQB's Standards and Reporting Team.

Too Many Category 2 and 3 Waters

In general, Amigos Bravos continues to be concerned that there are too many category 3 (not assessed for any uses) and category 2 (not assessed for all the uses) waters. Amigos Bravos encourages NMED to assess more waters to determine if the Livestock Watering and Contact uses are assessed.

SWQB RESPONSE: *As previously stated in our response to this concern on the 2008 Integrated List, available resources do not allow SWQB to sample all surface waters across the state for all associated criteria. The SWQB has a monitoring strategy that describes what can be done with the resources available to the bureau. The overall number of waters assessed for Livestock Watering Uses continues to increase each listing cycle. The overall number of waters assessed for Contact Uses also continues to increase each listing cycle since SWQB acquired mobile and office units for E. coli monitoring to accommodate the required 6-hour holding time.*

TMDLs and Category 5 Waters

Amigos Bravos does not think that writing a TMDL should automatically take a water off of the category 5 list. TMDLs, especially for non-point source pollution, the most common pollution source in New Mexico, are for the most part a paper exercise. They do not guarantee on-the-ground improvements in water quality. Waters should only be taken off the Category 5 list if monitoring shows that there has been an improvement in water quality and all the uses are being met. Just because EPA allows waters to be taken off the Category 5 list when a TMDL has been written doesn't mean that New Mexico should engage in this practice.

SWQB RESPONSE: *As previously stated in our response to this same concern on the 2008 Integrated List, SWQB agrees with your comments that Category 4A waters are still impaired. The integrated reporting (IR) Categories are automatically determined through the Assessment Database (ADB) EPA encourages states to utilize. When TMDLs for all impaired parameters for a particular assessment unit are complete and included in EPA's national TMDL database, the automated category for that water becomes Category 4A. If one or more impaired parameters do not yet have associated TMDLs, the automatic category stays as 5. SWQB considers both Category 4 and 5 waters as priority waters for restoration efforts during the selection of CWA 319 projects.*

Format

As mentioned in our comments on the 2006-2008 and in our 2008-2010 comments, without some form of track changes function, it is extremely difficult to track the differences in the draft 303(d)/305(b) list from year to year. We understand that due to the format the information stored (MS Access version of the ADB), it is impossible to generate the list
using the track changes function. Is it perhaps possible to indicate changes in a different manner (such as highlighting or bolding the text that is changed)?

SWQB RESPONSE: *As previously stated in our response to this same concern on previous lists, SWQB uses the MS Access version of the Assessment Database (ADB v. 2.3). Unfortunately for SWQB as well, it is not possible to generate the draft Integrated List from MS Access in a "Track Changes" format, or to highlight or bold text that is changed through this database format. SWQB does indicate at the front of every list the watersheds where the majority of changes have occurred. In 2009, The developers of ADB solicited suggestions for improvements to the database -- SWQB requested these changes. SWQB is exploring other options to make the Integrated List more user-friendly, such as including a spreadsheet version of the Integrated List that can be posted to the NMED web site as another way to explore and search for waterbodies of concern.*

Segment Specific Criteria

While we believe that NMED SWQB is correctly assessing the segment specific criteria Amigos Bravos is concerned that the list itself does not communicate this. Amigos Bravos would like to see the list clearly communicate whether or not the use specific criteria are being met. Would it be possible to add a category called "segment specific criteria" and then list either "fully supporting", "not supporting" or "not assessed" after it?

SWQB RESPONSE: *As previously stated in our response to this same concern on the 2008 Integrated List, SWQB does not believe it is necessary or wise to add a category called "segment specific criteria." Although not clearly stated in the current 20.6.4.97 – 20.6.4.899 NMAC format, even segment-specific criteria are associated with designated uses. It is important to relay in the Integrated List which designated uses are being impaired. SWQB proposed ways to reduce the amount of segment-specific criteria during the December 2009 triennial review because many of these are not truly segment-specific and thus better noted in 20.6.4.900 NMAC with their associated designated use.*

Thank you for the opportunity to provide comment on the draft list. We look forward to further discussion about the concerns that we have raised in our comments.

Please do not hesitate to contact me at 575-758-3874 or rconn@amigosbravos.org if further clarification or discussion on the above comments is merited or needed.

Sincerely,
Rachel Conn
Clean Water Circuit Rider and Policy Analyst
Amigos Bravos

COMMENT SET 14 – Southern Sandoval County Arroyo Flood Control Authority, Rio Rancho, NM

Southern Sandoval County
Arroyo Flood Control Authority
1041 Commercial Dr. S.E.
Rio Rancho, New Mexico 87124
(505) 892-RAIN (7246) • FAX (505) 892-7241
www.sscafca.com

February 16, 2010

Lynette Guevara, Assessment Coordinator
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

RE: Public Comment Draft 2010-2012 State of New Mexico Clean Water Act 303(d)/305(b) Integrated List

Dear Ms. Guevara:

I am in receipt of the proposed listing and appreciate the opportunity to comment.
SSCAFCA is concerned with the following impairments listed for the reach defined as Rio Grande (non-pueblo Alameda Bridge to Angostura Diversion), WQS: 20.6.4.106, AU: NM-2105.1_00;

Acute Aquatic Toxicity:
It appears that the Record of Decision acknowledges that the reason for non-support of this reach for toxicity is due to a known issue with respect to the Bernalillo WWTP and that compliance schedules would be enforced through the associated NPDES discharge permit (noted in 2006 and 2008). It is not clear whether or not the 2010 listing is the result of definitively determining that the WWTP discharge is not the reason for impairment. If this is the case, then it seems more prudent to pursue the impairment through the associated discharge permit and not include it on the 303d list, which would ultimately result in a TMDL for the entire reach. Additionally, this reach has been singled out for this testing when the upstream and downstream reaches have not been. SSCAFCA would request that this listed cause of impairment not be included in the 2010 listing.

SWQB RESPONSE*: The 2010 toxicity listing is just a continuation of a previously noted impairment listing because there were no new ambient toxicity testing data available to assess at the time of assessment. This has been clarified in the Record of Decision.*

SWQB erroneous included a "TMDL Schedule" date of 2009 for this impairment cause. This date has been removed per the below statement in the Assessment Protocols (ftp://ftp.nmenv.state.nm.us/www/swqb/MAS/Protocols/AssessmentProtocol.pdf):

> *"While ambient toxicity testing results are a valuable indicator, they are only the first step towards identification of a water quality concern. The particular pollutant(s) leading to the toxicity must be identified in order to take the next steps, such as development of total maximum daily load (TMDL) documents to develop a plan to address the problem."*

Oxygen, Dissolved:

Excluding any issue with the validity of the data used to list dissolved oxygen as an impairment, it is unclear why NMED would propose a TMDL for this reach in 2009 when the adjacent downstream reach will not have a TMDL developed until 2013. SSCAFCA would request that this listed cause of impairment not be included in the 2010 listing.

***SWQB RESPONSE**: SWQB believes these dissolved oxygen listings are valid and belong on the 2010 Integrated List; please see response to Bernalillo County on this topic for more details (Comment Set #2). SWQB erroneously included a "TMDL Schedule" date of 2009 for the dissolved oxygen impairment noted for assessment unit "Rio Grande (non-pueblo Alameda Bridge to HWY 550 Bridge)." This date has been changed to 2013.*

SSCAFCA also concurs with the comments submitted by Bernalillo County.

***SWQB RESPONSE**: Please see Comment Set 2 above.*

Sincerely,
David Stoliker, PE
Executive Engineer

COMMENT SET 15 – LANL, Los Alamos, NM

ENCLOSURE 1

LOS ALAMOS NATIONAL LABORATORY

COMMENTS TO DRAFT 2010-2012 NEW MEXICO 303(d)/305(b) INTEGRATED LIST

The National Nuclear Security Administration and Los Alamos National Security (NNSA/LANS) appreciate the opportunity to comment on the *Public Comment Draft 2010 - 2012 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated List* issued by the New Mexico Environment Department (NMED). The following comments are discussed in greater detail in the sections below.

- Thank you for delisting non-support for selenium and radium. Recent water quality data show attainment of criteria, consistent with previously documented recovery trends following the 2000 Cerro Grande Fire.

- Waters presumed subject to default Segment 98 intermittent standards may be ephemeral and capable of only limited aquatic life support similar to Segment 128 waters. Consequently, assessment of chronic criteria in Segment 98 waters may be unnecessary until an appropriate Use Attainability Assessment (UAA) is completed similar to the 2007 UAA conducted by the Department for Segment 126 and 128 waters. The 2008 Integrated List (IL) suggested that UAAs were being planned for many of the Segment 98 waters.

- Proposed updates to numeric criteria for aluminum (Al) and zinc (Zn), plus the new standards for natural background and site specific water quality criteria (i.e. copper biotic ligand model-BLM) were carried through the December 2009 WQCC Triennial Review with few issues. If promulgated, these new standards will have substantial impact on the current listings for Al, Zn, copper (Cu) and adjusted gross alpha.

- Assuming a hardness of 30 mg/L across the board for hardness dependent metal criteria (i.e. Cu, Zn) may result in inappropriate or unnecessary 303(d) listings. Many samples in NMED's assessment dataset for the Pajarito Plateau have concurrent hardness measurements that could be used to assess criteria attainment directly for each sample. NMED's Assessment Protocol calls for using concurrently collected hardness data when available. A sensitivity analysis shows small changes in the assumed hardness can have a significant impact on the number of criteria exceedances. In NMED's assessment data set, hardness data were available only for base flow and snowmelt conditions, while storm flow samples did not have accompanying hardness data. LANL's 2008 storm flow hardness assessment in receiving waters contained up to 423 samples across a wide range of hardness values. The RACER database contains concurrent copper, zinc and hardness data for storm flow samples collected by LANS at many of the gage stations assessed by NMED. These hardness data should be utilized for recalculation of existing metals data and evaluation for listing purposes.

- Background concentrations are apparent for gross alpha, aluminum and even polychlorinated biphenyls (PCBs) as evidenced by listings for assessment units (AUs) outside or upstream of LANL and other potential urban sources.

- There is insufficient data to develop TMDLs for PCBs at the present time. The use of Method 1668 (the congener method), which can detect PCBs at extremely low levels, may result in detection of PCBs above the Human Health criterion in rainwater or storm water sample analyzed. Also, the practice of ignoring non-detected results generated by Method 608 (the Aroclor method) overlooks an important screening tool used by NNSA/LANS to differentiate between significant source areas and potential background.

NNSA/LANS have expressed some of these concerns in the past. While those are reiterated below, with supporting details, we would propose the following single recommendation that address issues identified in this comment letter.

Overall Recommendation: NNSA/LANS recommend that all water bodies listed as Category 5A be placed in either Category 5B or 5C instead. In many cases, the 5B listing would be more appropriate because the standards should be evaluated before proceeding with a TMDL, especially in light of the proposed updates to numeric criteria for metals, and new standards for natural background and site specific water quality criteria presented at the December 2009 WQCC Triennial Review. In other cases, a Category 5C listing would be more appropriate because collection of additional data or validating assumptions would result in a better informed TMDL, and perhaps reduce the number of Category 5 listings.

Summary of progress since 2006 – 2008

Comment: The NMED / SWQCB have been responsive to certain issues raised during the review of the 2006 – 2008 IL. Selenium and Radium have been trending downward since the Cerro Grande fire and the removal of these constituents from the 2010-2012 303(d) list is consistent with observed trends.

The process for assessing acute and chronic aquatic life criteria is now better documented in NMED's current Assessment Protocol (Section 3.1.2, NMED 2009). For toxic constituents, segments are listed as "Fully Supporting" designated uses if, over the past three years of monitoring, no more than one exceedance of acute criteria and no more than one exceedance of chronic criteria has been measured.

The 2009 Draft Assessment Protocol (AP) was finalized in June 2009 in response to public comments, including NNSA/LANS comments. The final AP states that water quality data collected during unstable conditions are not to be used for assessment of chronic criteria, because they do not represent the four-day average duration portion of chronic numeric criteria. NMED provided a database with the Pajarito Plateau Assessment1 that included a field indicating the event type (base flow, ambient, snowmelt, and storm flow). It is assumed, for this review, that this field was used by NMED to screen for applicability of chronic criteria (i.e. storm flow samples would not be used for chronic criteria assessments).

The Study Conclusions spreadsheet2 summarizes the IL categories for each AU along with findings of support or non-support for a set of numeric criteria. The calculations NMED used to arrive at these listings were not included in either this spreadsheet or in the assessment database flat file.

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1 As downloaded from:
ftp://ftp.nmenv.state.nm.us/www/swqb/303d-305b/2010/PajaritoCOMBODataset-NonPCBs.xls

2 As downloaded from:
ftp://ftp.nmenv.state.nm.us/www/swqb/303d-305b/2010/PajaritoAssessmentConclusions.xls

Thus, it is not explicit how NMED reduced the raw data to arrive at each finding of support or non-support listed in the Study Conclusions spreadsheet (such as handling non-detects, lab qualifiers, duplicates, blanks etc).

The Study Conclusions spreadsheet has the column headers listed below. The abbreviations after each parameter appear to indicate the designated uses that are applicable for each criterion: wildlife habitat (WH), human health (HH), aquatic life (AL), and livestock watering (LW).

- PCBs - Chronic AL
- PCBs - WH
- PCBs - HH
- Aluminum-Chronic AL
- Aluminum-Acute AL
- Copper-Acute AL
- Mercury-WH
- Zinc-Acute AL
- Adj Gross Alpha – LW

The above list of column headers suggests that they were the only parameters screened for attainment of designated uses. An initial review of the Public Draft Integrated List appears to confirm this for most segments; however, there are exceptions. For example, Ten-Site Canyon, Mortandad Canyon to Headwaters, AU NM-128.A_17 appears in the IL as "Not Supporting" due to arsenic and silver, in addition to other constituents appearing in the Pajarito Assessment Conclusions summary spreadsheet.

The effort NMED put into making their raw assessment data and conclusions available and transparent is gratefully acknowledged. It would also be helpful however to supply the data reduction products NMED used to make their determinations of support or non-support. The comments and requests presented below are intended to continue a constructive discussion about prioritized actions to attain water quality standards.

Request: In addition to the brief clarifying questions below, the more fundamental response sought from NMED is to continue the process of sharing data and interpretations as a way of mapping out the most important next steps.

- Please clarify that the "Sample Event Type" field (Column F) of the non-PCBs database provided with the Pajarito Assessment was used to determine whether or not measurements are compared to chronic criteria.

SWQB RESPONSE*: You are correct. The "Sample Event Type" field (Column F) of the non-PCBs database provided with the Pajarito Assessment was used to determine whether or not measurements were compared to chronic criteria for assessment purposes during the development of the draft 2010 Integrated List. This approach is consistent with the current Assessment Protocols available at http://www.nmenv.state.nm.us/swqb/protocols/.*

Regarding the Study Conclusion spreadsheet, all parameters with available data and applicable water quality criterion were assessed for the draft 2010 Integrated List. The Study Conclusions spreadsheet only contains the determined Causes of Impairment on the Pajarito Plateau as a result of these assessments.

The following sections present our recommendations to resolve the issues NNSA/LANS identified in reviewing the current Integrated List and associated NMED documents and data sets.

1. TMDL Priorities

Comment: Almost all TMDLs proposed under Category 5/5A listings are scheduled for adoption in 2012. The tools provided by the integrated list guidance can help prioritize TMDL development. It makes more sense to phase TMDL development by focusing on the high priority listings where the evidence for impairment is clear. Many of the findings that designated uses are not-supported have substantial uncertainties associated with them. The remainder of our comments focuses on those uncertainties and proposes alternatives that can be taken by following the listing guidance.

Request: Please help set priorities for TMDL development by proposing alternative listing categories and specific information needed to resolve uncertainties. It would be helpful for NMED to clarify the external regulatory driver to establish TMDLs by 2012 as it is prudent and appropriate to make sure that the listing category reflects the appropriate next step.

SWQB RESPONSE: *EPA expects states to establish appropriate schedules for the establishment of TMDLs for all waters on the most recent CWA section 303(d) list (i.e., category 5 waters on the Integrated List). EPA also expects development of TMDLs within eight to thirteen years after impairments are first listed on the Integrated List, but recognizes that this could be shorter or slightly longer depending on State-specific factors. These expectations are detailed in EPA's 1997 Memorandum from Robert Perciasepe to Regional Administrators and Regional Water Division Directors (available at http://www.epa.gov/OWOW/tmdl/ratepace.html). Some of the Pajarito Plateau surface waters were first listed for certain parameters in 2004. For planning purposes, SWQB typically projects TMDL completion to occur 2-4 years after a comprehensive watershed survey is completed. Other stakeholders providing comment on the draft 2010 Integrated List are requesting an accelerated TMDL development schedule for the Pajarito Plateau. SWQB believes establishing a projected TMDL completion date of 2012 for the Pajarito Plateau is a balanced approach.*

As noted, the results of the recent triennial review may require re-assessment of various metals such as aluminum prior to TMDL development to determine if the impairment status has changed. SWQB believes any necessary re-assessment and initial drafting of any subsequent necessary TMDLs can be accomplished within the timeframe stated.

2. Category 5B for Aluminum, Copper, and Zinc

Comment: There are numerous new Category 5A listings for AUs based on findings of non-support for aluminum, copper and zinc acute aquatic life criteria. At the WQCC Triennial Review hearing in early December 2009, testimony was presented by NNSA/LANS and CMI for proposals to update the NM aquatic life WQC for Al, Zn and other metals, and to allow WQC for copper to be developed by using the biotic ligand model (BLM). The aluminum criteria should be updated as proposed to include the hardness relationship similar to other hardness dependent metal WQC. These updates to the numeric WQC increase the accuracy of aquatic life protection because they incorporate more recent data and better scientific approaches than the current (2007) NM WQC basis. There was no opposition to these updates presented at the WQCC Triennial Review hearing (other than reconciling the aluminum phase basis). The preliminary EPA review comments indicated the proposed updates were generally suitable, while subject to some limited comments which were addressed in the testimony presented at the hearing. Consequently, proceeding with a TMDL based

on soon to be outdated criteria could result in unnecessary actions and expenditure of resources.

Request: Please change the listings related to Al, Cu and Zn non support from 5A to 5B because the standards should be evaluated in light of the WQC updates anticipated as a result of the Triennial Review. This Category listing will use regulatory guidance to enable coordination between Impairment Assessment and Triennial Review processes.

SWQB RESPONSE: *SWQB uses the Assessment Database (ADB) developed by EPA to house assessment metadata and produce the Integrated Report. This database structure allows one integrated reporting (IR) category per assessment unit, so it is not possible to note different IR categories for each cause of impairment. ADB automatically determines if the category should be 1, 2, 3, 4A, 4B, 4C, or 5. Categories 5A, 5B, and 5C were added at New Mexico's request, and are manually selected once Category 5 is automatically determined.*

As stated in Section I(A) of the Record of Decision and Preface to the Integrated List, EPA is not anticipated to approve changes to 20.6.4 NMAC as a result of the December 2009 triennial review by April 1, 2010. Therefore, 20.6.4 NMAC as amended through August 1, 2007 are the applicable water quality standards for development of the 2010-2012 Integrated List. SWQB believes it would be inappropriate and confusing to incorporate speculation regarding WQCC and EPA's actions regarding the proposals made at the 2009 triennial review into development of the 2010-2012 Integrated List because the impending outcome is not relevant to the 2010-2012 Integrated List.

As stated above, SWQB will re-assess parameters on the Pajarito Plateau that are impacted by the final results of the December 2009 triennial review prior to TMDL development. These results will determine the final list of parameters needing TMDLs, and will be reflected in the next Integrated List following EPA approval of proposed revisions to the water quality standards.

3. Alternative: Category 5C for metals

Comment: As stated above, the preferred alternative is that for all findings that designated uses are not supported because of aluminum, copper, or zinc, that the listing category be 5/5B (Standard will be reviewed). That approach would address concerns over whether the criteria are appropriate to the uses, as well as some of the data analysis and sample collection concerns brought up in this comment. If NMED believes the Category 5/5B listing for metals is not appropriate, NNSA/LANS requests that, at a minimum, NMED consider applying Category 5/5C (Additional data will be collected before a TMDL is scheduled). The basis for this comment is very straightforward: as insufficient data exists to show that metals water quality criteria are exceeded.

It was helpful for NMED to share the analytical database used to conduct the Pajarito Assessment. It allowed a review of the assessment and how the assumptions in the 2009 Assessment Protocols affect the outcomes. NNSA/LANS findings indicate that the majority of the criteria exceedances may result from the assumed hardness value of 30 mg/L that NMED used to calculate the hardness dependent metals criteria.

The assessment of metals criteria should use event/site-specific criteria calculated based on concurrently measured hardness values. NMED's current Assessment Protocol requires the use of concurrently collected hardness data when available and states the following procedure on page 4:

> *When there are metals results **above** the quantification limit, a screening level using the lowest measured hardness value in the data set to calculate hardness dependent criteria may first be employed to determine the potential for any exceedances in the data set. If any measured values are above the associated criteria determined in this way, **the assessor***

must calculate appropriate hardness-dependent metals criteria for the sampling event(s) using concurrently-collected hardness *and the formulas in 20.6.4.900 NMAC (see the hardness-dependent calculator spreadsheet in \SWQB Public\MAS Core Documents). If concurrently-collected hardness data are not available, the lowest available hardness value within a seven-day period of the sample collection date may be used with a note in the Comments section of the appropriate Assessment Form explaining why concurrently-collected data were not used. If no hardness data (or adequate data to calculate hardness) are available within a seven-day period of the sample collection date, it is permissible to use conservative hardness estimates determined by qualified natural resources agencies or entities as appropriate for that water body. This deviation must be noted on the appropriate Assessment Form. Generate a spreadsheet that details the station, date/time, hardness, hardness-dependent criteria, and sample result. This spreadsheet must be included as part of the electronic record.*

Please note that of the 891 samples in the Pajarito Assessment database, only 167 had concurrent hardness data. All of those 167 samples with concurrent hardness data were either listed as base flow, snowmelt, or ambient samples – none of the reported storm runoff or storm samples had hardness values. NNSA/LANS has produced a report on the hardness of storm water samples (LA-UR-08-037671) that included hardness values for 423 storm flow samples collected in receiving waters. Hardness is typically measured along with metals and other parameters; it would be better, for the purposes of assessment, if the concurrent hardness values associated with each sample were included in the database, to allow assessment of event / site specific hardness criteria to compare metals measurements against.

It is assumed that the hardness report (LA-UR-08-037671) was the basis for NMED to make the simplifying assumption of using a hardness of 30 mg/L in all storm water for the assessments, based on the geometric mean of the 423 samples. However, a sensitivity analysis reveals that even a slight change in the assumed hardness will dramatically affect the number of samples exceeding criteria.
The sensitivity analysis was conducted by creating a pivot table from the raw data provided by NMED for the Pajarito Assessment. The workbook was set up to calculate event/site-specific hardness criteria where hardness was available, or otherwise to use the assumed values cited in the Assessment Protocol - 30 mg/L and 62 mg/L for storm flow and stable conditions. The number of exceedances was consolidated for the data set as a whole, and for individual station locations within each assessment unit. The number of exceedances as a function of hardness was explored and tabulated.

As can be seen in Figure and 2, the number of exceedances in the entire data set drops dramatically with only a small change in the assumed hardness - from 30 mg/L hardness to 45 mg/L hardness the number of copper exceedances drops by nearly a half.

Another reason this is important is that many samples in the database would be expected to contain high suspended sediment concentrations due to the use of single stage samplers or fixed auto sampler intakes in natural stream channels. When sediment transport via bed load is high, samples collected at or near the bottom of the channel can include high sediment concentrations. Relatively high suspended loads could increase dissolved ions – including both hardness (e.g., calcium and magnesium) and metals. The use of a default value of 30 mg/L hardness will tend to bias the impairment assessment by screening samples with higher metal and hardness content against a lower hardness-based criterion.

Request: In the event that NMED chooses not to list all metals impairments as Category 5/5B, please consider making all metals listing Category 5/5C. It may be important to re-run the

assessments using the concurrent hardness data already in the NMED data set and the missing hardness data from RACER. Assessing the metals criteria exceedances using concurrent hardness data would be consistent with NMED's current Assessment Protocol.

SWQB RESPONSE: *As stated in the Additional Information regarding the Pajarito Plateau (ftp://ftp.nmenv.state.nm.us/www/swqb/303d-305b/2010/PajaritoPlateauSpecialStudyExcerpt.pdf), SWQB used a hardness value of 30 mg/L as CaCO3 to determine the applicable hardness-dependent metals criteria for acute aquatic life assessments. This value was based on the geometric mean of nearly 455 stormwater hardness values collected during 2004-2007 from receiving waters (i.e. streams). This value has also been used by EPA to set concentration limits for the stormwater LANL permit. To determine the applicable hardness-dependent metals criteria for chronic aquatic life assessments, a hardness value of 62 mg/L as CaCO3 was used (see table below). This value was based on the geometric mean of nearly 245 hardness values collected during baseflow, ambient, or snowmelt conditions during 2004-2007 from receiving waters (i.e. streams). SWQB stated this exception to the general rule of using concurrently-available hardness data because we believed this was a reasonable approach given the total volume of data we were collating, reviewing, and assessing to develop the draft 2010-2012 Integrated List.*

To address your concerns, SWQB will change the IR category to 5/5C for any assessment unit that has an impairment listing as a result of using a default hardness value. We will also include the following AU Comment:

> *"This AU is noted as category 5C because the availability of concurrent-hardness data needs to be determined and utilized when available to verify any cause(s) of impairment that are a result of applying hardness-dependent criteria."*

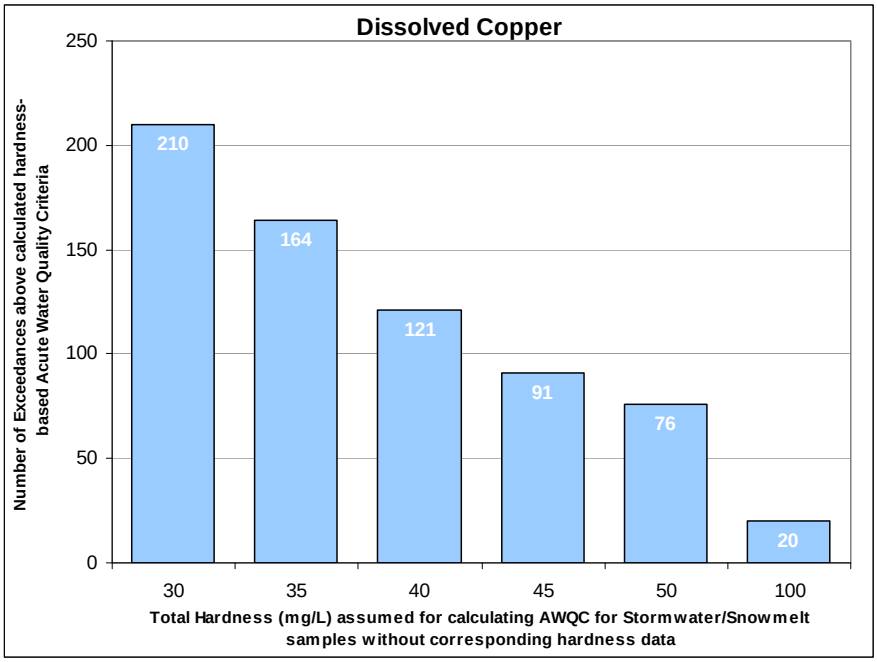

Figure 1 - The number of copper exceedances decreases with increasing hardness.

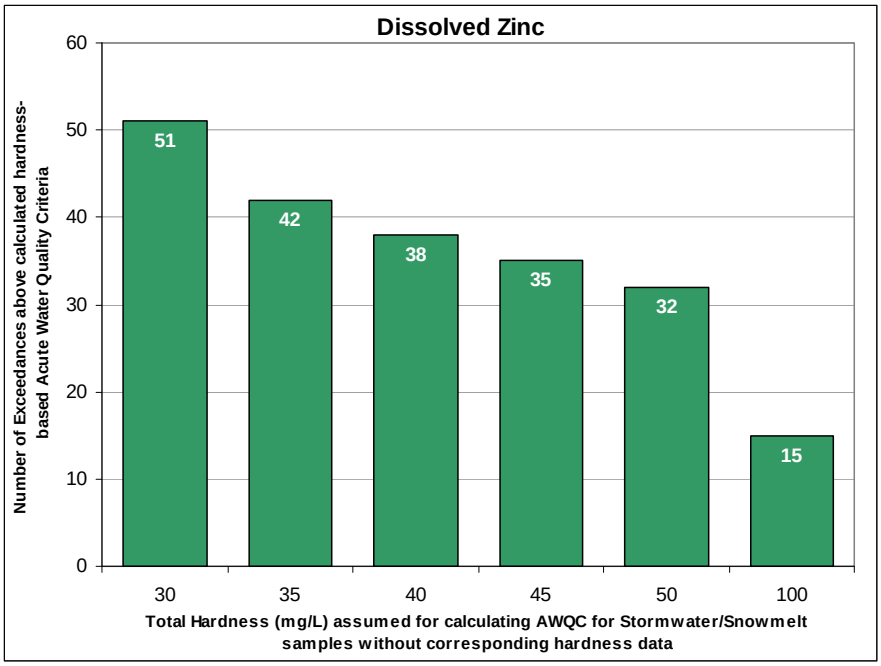

Figure 2 - The number of zinc exceedances decreases with increasing hardness.

4. Category 5B for Unclassified Waters

Comment: Nineteen AUs are denoted as Segment 98*, meaning that they are unclassified segments and presumed to be intermittent streams subject to Segment 98 marginal warm water aquatic life uses until formally classified by a Use Attainability Analysis (UAA). This presumption is consistent with the 2005 Triennial Review and subsequent direction from the United States Environmental Protection Agency. As NMED indicates in the Pajarito Plateau Study notes, this presumption leads to the application of chronic aquatic life criteria to protect the aquatic life use. Each of these unclassified AUs includes the following comment:

> This unclassified AU may be ephemeral or intermittent; however, per EPA Region 6, instruction, it is being noted under 20.6.4.98 at this time and marginal warm water aquatic life (MWWAL) and primary contact (PC) are presumed uses for all waters noted as 20.6.4.98.

Many Pajarito Plateau waters that have been presumed as intermittent under Segment 98 would be expected to be similar to Segment 128 waters in the vicinity. According to 20.6.4.128NMAC, Segment 128 waters have only a limited aquatic life use designation and hence require acute, but not chronic aquatic life criteria. The department's 2007 UAA for Segment 128 waters presented the evidence necessary to show limited aquatic life use was an appropriate use designation given the absence of fish populations and highly intermittent and ephemeral flows. That UAA was approved by the USEPA and incorporated in the 2007 standards.

Request: Please change all listings related to non support of chronic WQC in Segment 98 waters from Category 5A to 5B. Until the standards are updated via a UAA to determine that aquatic life uses are present that justify chronic criteria protection, a TMDL for chronic criteria exceedances would be premature.

SWQB RESPONSE: *See above response to item #2. SWQB was directed by EPA to assess*

these waters against both chronic and acute criteria based on the current water quality standard, and believes the current AU Comment reflects that directive. As already stated, the results of the recent triennial review will require re-assessment of any assessment unit where the applicable water quality standard segment and/or associated designated uses have changed prior to any TMDL development.

5. Application of data from short term sampling periods to criteria for wildlife habitat and human health

Comment: In responses to comments on the 2006 – 2008 proposed 303(d) list, NMED asserted that it is not restricted from screening "first flush" storm flow data against criteria for wildlife and human health (e.g. PCBs, mercury) which are intended to reflect long term exposures. Accepting that this is NMED's method for screening water quality data, it is still important to note that bioaccumulation of pollutants like PCBs and mercury is a result of long-term exposure, not instantaneous events. Therefore, the long term average concentration of these constituents in water, sediments, and prey organisms is the key to characterizing risk to people and wildlife. While NMED may believe that using data from short term sampling periods to assess wildlife and human health criteria is a valid screening approach to identify *potential* impairments, these relatively short term exceedances do not confirm long term impairment. The logical next step, for AUs that exceed wildlife or human health criteria for PCBs and/or mercury in short term water sampling events, is to gather more data by assessing long term concentrations, and monitoring in sediments and biological samples to assess ecological risk.

Request: Please consider Category 5/5C listings for PCBs and mercury. The additional data to be gathered prior to TMDL development would be long term average concentrations in water, concentrations in sediments and biological samples, and assessment of ecological risk.

***SWQB RESPONSE**: SWQB understands LANL's concern regarding criteria development. The appropriate venue for these concerns is through revisions to 20.6.4 NMAC. The Integrated Listing process requires determination of impairment due to individual parameters for which there are water quality criteria adopted by the WQCC. There is no requirement to determine long-term average concentrations in various media or to assess ecological risk during the determination of impairments for the Integrated List.*

6. Land Use Data to Inform Possible Sources

Comment: When considering influences of possible sources on water quality in certain AUs, there are a variety of land uses, land ownership and jurisdictions that would be helpful to consider. For example, Pueblo Canyon waters pass through Los Alamos County lands and receive runoff and other potential discharges from a variety of public and private landowners, including the Bayo WWTP. While certain LANL historic activities are being managed under RCRA and NPDES regulatory programs in the Pueblo watershed, runoff from Los Alamos County and private landowners would clearly represent the vast majority, by volume, of storm flows at just about any point in the Pueblo watershed. LA County is not currently covered under a Phase II MS4 permit, and storm water management practices may need to be addressed. Copper and zinc in particular are well known constituents found at elevated concentrations in runoff from developed areas and transportation sources. The NPDES permit for the Bayo WWTP has no current effluent limits for copper and zinc. While effluent limits for copper come into effect for the Bayo WWTP in mid 2010, the 30 day average and daily maximum limits of 28.5 µg/L and 42.8 µg/L, respectively, are clearly in excess of the 4.3 µg/L value used by NMED to assess copper. This treatment plant also has no

Request: Please consider urban runoff from non-LANL sources as probable sources of impairments and acknowledge these in listings for the Pueblo watershed AUs. Also, please assess the impact of the Bayo WWTP effluent on the multiple listings for the AU that this plant discharges to (PCBs, aluminum, copper, zinc and gross alpha.

SWQB RESPONSE: *SWQB recognizes urban runoff from non-LANL sources as a probable source in waterbodies such as Pueblo Canyon and is working with EPA to address this issue. SWQB has noted a probable source of "Post-development Erosion and Sedimentation" on previous Integrated Lists for waterbodies that may be impacted by urban runoff. As stated in Section I (C) of the Explanatory Notes to the draft 2010 Integrated List and Preface to the ROD, the approach for identifying "Probable Sources of Impairment" on the Integrated List has been modified. During development of draft 2010 Integrated List, any new "Probable Cause of Impairment" was assigned a Probable Source of "Source Unknown." Probable Sources noted on most recent Site Condition/Probable Source Sheets and gathered from comments such as the one you have provided will be used to generate draft Probable Source list in subsequent TMDL planning documents. These draft Probable Source lists will be finalized with watershed group/stakeholder input during the draft TMDL meeting and public comment period. The final Probable Source list in the approved TMDL will be used to update the subsequent draft Integrated List. SWQB has also created a Probable Sources webpage as an additional way to solicit stakeholder input (http://www.nmenv.state.nm.us/swqb/PS/).*

Regarding Bayo WWTP, the 30-day average and daily maximum limits of 28.5 µg/L and 42.8 µg/L noted in the 2006 permit are for total copper and were developed using a hardness value of 94 mg/L to determine the total copper effluent limit necessary to meet the applicable dissolved copper water quality criterion. These effluent limits for copper should have come into effect in mid 2009 according to the NPDES permit. Regardless of any effluent limits in the current permit, it is not necessary to determine the impact of WWTP effluent during the impairment listing process. Any potential contributions from the Bayo WWTP will be discussed in the TMDL and taken into consideration during the permit renewal process. The current permit is scheduled to expire June 2011.

7. Include / Acknowledge Background as Possible Source

Comment: NMED has appropriately recognized that aluminum is a naturally occurring element, and therefore likely to be present in natural background. Indeed, several AUs upstream or outside of LANL, which have little if any anthropogenic impacts show elevated dissolved aluminum, which has resulted in acute criteria exceedances and 303(d) listings (Canon de Valle and Water Canyon above LANL). The same is true for gross alpha and even PCBs (above HH criteria) at Canon de Valle above LANL. PCBs are not naturally occurring, but they are widespread on a global scale in environmental media. Each of these constituents is associated with sediments – at higher suspended sediment concentrations, higher metal, gross alpha, and PCB concentrations are expected.

As pointed out in previous comments to NMED, PCB concentrations that exceed the human health water quality objective (0.64 ng/L) can be found in precipitation samples collected from areas as far away as the Arctic (see Figure 3 below). Precipitation samples from urban areas, such as Paris and Chicago, can exceed the wildlife habitat criterion (14 ng/L). A current study is under way to characterize background concentrations of PCBs relevant to the Pajarito Plateau.

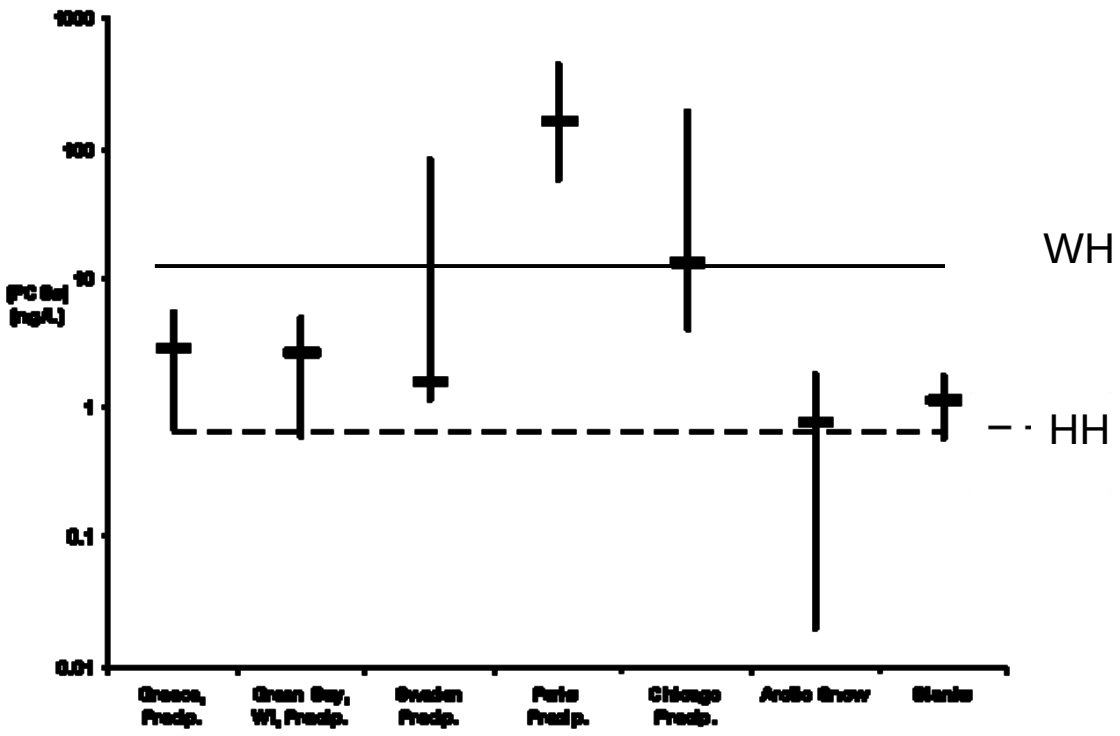

Figure 3. Concentrations of PCBs in precipitation and blank water compared with Total PCBs water quality criterion for wildlife habitat (WH) and human health (HH).

The horizontal bars indicate the median value and the vertical bars indicate the range. References are listed in Table 1.

Table 1. References to studies included in Figure 1.	
Location	**Citation**
Heraklion, Greece	(Mandalakis and Stephanou, 2004)
Green Bay, Wisconson	(Franz and Eisenreich, 1993)
Southern Sweden	(Backe et al., 2002)
Paris, France	(Teil et al., 2004)
Chicago, Illinois	(Offenberg and Baker, 1997)
Canadian Arctic Snow	(Gregor and Gummer, 1989)
Blanks (field and laboratory procedural blanks included in referenced studies)	(Gregor and Gummer, 1989) (Franz and Eisenreich, 1993)

Request: In addition to aluminum, please discuss background as a potential source for copper, zinc, gross alpha, and PCBs. Please consider listing these constituents under Category 5/5C while background data is developed to support TMDL analysis.

SWQB RESPONSE: *Please see response to #6 above regarding probable sources. For purposes of the 2010 Integrated List, the noted probable source list will simply state "Source Unknown." Your above concerns are noted and will be taken into consideration during development of the TMDL. To address the PCB information presented above, "Atmospheric Deposition – Toxics" will be added to the probable source list in the upcoming draft PCB TMDLs.*

One of the goals of the sampling and analysis plan for the SWQB Pajarito Plateau survey was to gather data for a variety of parameters from waterbodies above LANL property as a way to understand the potential for background contributions. This will be discussed in the draft TMDLs as well.

8. PCBs TMDL Development is Premature

Comment: There is insufficient data to develop TMDLs for PCBs at the present time. The use of Method 1668 (the congener method), which can detect PCBs at extremely low levels, could possibly result in detection of PCBs above the Human Health criterion in rainwater or storm water sample analyzed. This should be considered as an input to the watershed in the TMDL process. In addition, the evaluation of samples with high suspended loads within LANL boundaries tends to bias comparison to ambient upstream, background locations. Also, the practice of ignoring non-detect results generated by Method 608 (the Aroclor method) overlooks an important screening tool used by NNSA/LANS to differentiate between significant source areas and background. It is acknowledged that some sites need to be addressed with enhanced BMPs or other corrective actions to reduce PCB discharges; many of those actions are already under way. But the information needed to develop PCB TMDLs is lacking; data gaps include numeric targets in fish tissue, the linkage to water and sediment concentrations, and background levels for determining background load allocations.

Request: List PCBs under Category 5/5C while additional data gaps are filled to support TMDL development.

SWQB RESPONSE: *SWQB believes we have an adequate data set to draft PCB TMDLs. Although SWQB recognizes EPA Method 608 may have value as a screening tool, this method is not useful for determining whether or not all applicable criteria are met. As stated in the current Assessment Protocols:*

> *"2.1.8 "Non detects" from a method with a detection limit greater than the criterion*
>
> *If the detection limit is above the applicable criterion and the laboratory result is reported as below this limit, the result cannot be used for a listing decision (for example, when the detection limit is 8.0 mg/L, the result is reported as <8.0 mg/L, and the criterion is 5 mg/L). In this situation, this datum contains no information about the magnitude relative to the applicable water quality criterion."*

For these reasons, the practice of ignoring non-detect results generated by Method 608 is necessary for assessment purposes.

9. Post Cerro Grande Fire

Comment: As mentioned in the introduction, selenium and radium have been delisted due to decreasing concentration trends presumably attributable to stabilization of soil surfaces after the 2000 Cerro Grande Fire. There may be a few lingering elevated outliers for other constituents such as copper, aluminum and gross alpha in the 2004 period that could be attributable to post fire conditions that have since stabilized as evidenced by fairly consistent lower values in more recent periods.

SWQB RESPONSE: *Thank you for your comment.*

10. Pollutants of Human Origin

NNSA/LANS acknowledge the importance of adequate monitoring and Best Management Practices (BMPs) for pollutants such as mercury and PCBs and believe that existing pollution control requirements and regulatory vehicles are sufficient to protect water quality. Therefore, NNSA/LANS recommend changing listings from category 5A to 4B ("other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future").

According to the Integrated Report Guidance (EPA 2005, p. 54):

> "EPA regulations recognize that alternative pollution control requirements may obviate the need for a TMDL. Segments are not required to be included on the section 303(d) list if technology-based effluent limitations required by the Act, more stringent effluent limitations required by state, local, or federal authority, or "[o]ther pollution control requirements (e.g., best management practices) required by local, State or Federal authority" are stringent enough to implement applicable water quality standards (see 40 CFR 130.7(b)(1)) within a reasonable period of time. This guidance acknowledges that the most effective method for achieving water quality standards for some water quality impaired segments may be through controls developed and implemented without TMDLs (referred to as a "4b alternative")." (EPA 2005, p. 54)

If downstream water bodies are determined to be impaired, category 4B would be appropriate. However, for bioaccumulative pollutants such as mercury and PCBs, monitoring in the food chain (e.g., invertebrates or the eggs of foraging birds) and food web modeling are the tools most appropriate for evaluating protection of wildlife habitat. If a TMDL is determined to be necessary, this category can always be revised to 5/5A in a future listing. It is premature to make that determination with the available storm water monitoring information.

The pollution control requirements applicable to AUs potentially impacted by past and present LANL operations include:

- Multi-Sector General Permit (MSGP) for storm water discharges from industrial activities (Permit Nos. NMR05A734 and NMR05735)[these permit numbers need updating because they refer to the FFCA era permit for SWMUs, not the current MSGP 2008 applicable to Industrial Activities that are not covered by the Individual Permit for SMWUs].

- NPDES Permit No. NM0030759 (EPA 2009) for storm water discharges from solid waste management units (SWMUs) and areas of concern (AOCs). This permit contains numeric target levels for storm water discharge sampling. If samples exceed the target levels, pollution control activities including BMPs are required to be addressed and enhanced as needed. While this permit is under appeal currently, it appears that the target levels and technology-based requirements will remain relatively unchanged.

- NPDES Permit No. NM0028355 (EPA 2007) (industrial outfall permit) authorizing discharges to the following receiving waters: Mortandad Canyon, Canada del Buey, Los Alamos Canyon, Sandia Canyon, Ten Site Canyon, Canon de Valle, and Water Canyon, in Water body Segment Nos. 20.6.4.126 and 20.6.4.128 of the Rio Grande Basin.

- Atomic Energy Act (AEA) of 1954. Gross alpha assessments should exclude radon and uranium, as well as the source, special nuclear and byproduct material regulated under the Atomic Energy Act (AEA) of 1954.

SWQB RESPONSE: *SWQB has also given some thought to the option of category 4B for some of the waters on the Pajarito Plateau where other pollution control requirements are already in place. It is important to note that EPA has several requirements that must be met in order to move an identified impairment into Category 4B. As first explained in the 2006 Integrated Reporting Guidance, States need to submit additional information regarding Category 4B waters with their Integrated List submission to clearly demonstrate how these other mechanisms are or are expected to address the noted pollutants within a reasonable time frame. This additional information includes the following six elements:*

- *Identification of segment and statement of problem causing the impairment;*
- *Description of pollution controls and how they will achieve water quality standards;*
- *An estimate or projection of the time when WQS will be met;*
- *Schedule for implementing pollution controls;*
- *Monitoring plan to track effectiveness of pollution controls; and*
- *Commitment to revise pollution controls, as necessary.*

Attachment 2 of the 2008 Integrated Reporting Guidance contains a detailed recommended structure for this additional information (see http://www.epa.gov/owow/tmdl/2008_ir_memorandum.html). SWQB is willing to explore the appropriateness of assigning Category 4B to certain waterbodies on the Pajarito Plateau, and would welcome LANL's participation in demonstrating and documenting the effectiveness of mechanisms already in place.

11. Segment-Specific Comments

The following analysis of specific segments provides additional background information on the uses and activities in the water bodies that are the subject of this comment letter. We hope that this information helps NMED make reasonable decisions about the appropriate categories for listed water bodies.

Guaje Canyon: Guaje is a major tributary to Los Alamos Canyon that was listed as impaired for gross alpha and selenium in 2002, and then listed for aluminum in the 2010-2012 IL. There is little development throughout the watershed. There are no known past Laboratory testing activities except for drinking water utilities owned and maintained by Los Alamos County. There is one known potentially contaminated site – an electrical transformer associated with old drinking water wells and an associated unpaved road. A small pumice mine is located north of the Rendija confluence on top of the mesa. Some post-development erosion and sedimentation could be associated with the well sites, the unpaved road, recreational use, and the pumice mine. Although this is a relatively undisturbed watershed, the exceedances triggering listings were among the greatest in magnitude. This supports the NNSA/LANS contention that constituent and water body listings are due primarily to natural causes.

Data from Gage Station E240 appear to have been included in AU NM-128.A_07 Pajarito Canyon (within LANL above Starmers Gulch). Gage station E240 is located outside of LANL boundary (DOE property) and is upstream of LANL activities. Therefore, data from E240 should not be included in this AU. Rather, only data from gage station E241 should be included in this AU because it is within the LANL boundary (DOE property). The Pajarito Plateau Study summary suggests that the NPDES permit for SMAs contains "permit limits" and that "clean up will be required through the NPDES permit mechanism". These terms are inaccurate and should be revised to reflect the actual permit. The permit applies numeric values for certain parameters as "target action levels", and the permit clearly states "the target action levels are not themselves

effluent limitations". Also, the end point of monitoring and adaptive assessments under the permit are technology based BMPs, which will be enhanced as needed, and to the maximum extent practical to reduce pollutants. If the target levels are not attainable after multiple rounds of sampling and enhancement, the permit allows EPA to make a determination that further enhancements are not needed on a case by case basis, which could include consideration of natural background levels of certain pollutants. Clearly, the permit does not require "cleanup" as a final endpoint.

SWQB RESPONSE: *Regarding E240, our GIS coverage of LANL's boundary indicates that station E240 is within the LANL boundary. According to LANL staff (Sam Loftin), E240 was moved to just inside the LANL boundary (i.e., west of state road 501) after the Cerro Grande fire. Regardless, SWQB agrees that the data from E240 is more representative of water quality conditions in the upstream assessment unit and will re-assess accordingly. As a result of the re-assessment, the following revised impairments are noted in the final draft ROD, Integrated List, and Pajarito Plateau Summary Conclusions spreadsheet:*

- *Pajarito Canyon (upper LANL bnd to headwaters) – listed for PCBs – WH and HH, aluminum – acute and chronic AL, copper – acute AL, and adjusted gross alpha – LW*

- *Pajarito Canyon (within LANL above Starmers Gulch) – listed for aluminum – acute AL, and adjusted gross alpha – LW*

Thank you for the clarification regarding the permit. SWQB has revised this bullet to be the following:

- *If data from SMA sampling locations exceed target action levels stated in the applicable NPDES permit(s) for a particular parameter (which is the WQ criterion because there is no dilution factor), technology-based best management practices (BMPs) necessary to reduce pollutants will be enhanced as needed through the NPDES process.*

Using passive single stage sampling techniques for storm flow characterization may high bias certain constituents if bed load sediment concentrations are elevated. Single stage samplers are embedded in the natural channel bottom sediments and have little to no control over sampling elevations with respect to differentiating bed load from water column sampling positions. Water samples that include excessive bed load would not properly represent the overlying water column where the numeric criteria are applicable. Also, these passive sampling techniques have no "time stamp" recorded directly to verify the actual sample collection time or sampling duration. The 2010-2012 data set indicates that NMED has used data from environmental liquid samplers ("ELS") single stage samplers in the IL assessments. Exceedances for sample data collected by ELS samplers should be checked for potential bed load bias and qualified as an outlier, or potentially non-representative samples that should not be used in assessments. It appears ELS sample data exceeded criteria for PCBs, aluminum, copper, and adjusted gross alpha. However, samples collected using auto samplers often appear to be lower than the ELS data. Therefore, the associated listings may contain bias from single stage methods that may need further evaluation.

SWQB RESPONSE: *SWQB recognizes that there is always a chance for bias if the intake is set too low to the channel bottom, regardless if the sampler is an automated ISCO or a single stage ELS. We tried to control for this potential bias with the single stage samplers by setting the intake*

level at the bottom of the ELS collection screen 3 – 6 inches (generally 4 inches depending on site conditions) above the channel bottom. It was necessary to incorporate single stage ELS samplers into the Pajarito Plateau study design given the number of sites were attempting to sample vs. the available number of ISCO samplers. ELS samplers also work well in remote locations where it would not be possible to haul in ISCO samplers and associated equipment.

Excerpt from 2009 NMED Assessment Protocol, Section 3.5, Assessing Livestock Watering Support, footnote to Table 3.10:

> *When radionuclides are analyzed using EPA Method 900.0 (recommended), gross alpha and gross beta results generated using an Am-241 reference and a Sr/Y-90 reference, respectively, will be used for purposes of assessing standards attainment because these references are prescribed in the method description. If the information is not available for the type of reference used to generate a reported value, the highest value available will be assessed. Also, the water quality criterion in 20.6.4.900.J is for "adjusted gross alpha." Gross alpha data must be adjusted by subtracting contributions from natural uranium, as well as any measured special nuclear and by-product material, as called for in the definition in 20.6.4.7.B NMAC. To convert uranium concentrations reported in ug/L to pCi/ug a conversion factor of 0.67 is used. In the absence of U-mass to correct for adjusted gross alpha, U-238 can be used because this is the most common form of uranium radiation in the natural environment In the event that negative values are reported for special nuclear materials are reported, zero will be substituted for purposes of adjusting gross alpha radiation.

Conclusions

Thank you for the opportunity to comment on the *Draft 2010 - 2012 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated List*. It is the intention that the comments and discussion provide a scientific framework for clarifications and updates to the current *Draft 303(d)/305(b) Integrated List*. NNSA/LANS look forward to working with NMED and other interested stakeholders to provide adequate data for the development of future TMDLs.

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ATTACHMENT A – Van Horn Data Review

NEW MEXICO ENVIRONMENT DEPARTMENT

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MEMORANDUM

TO: **James Hogan, SWQB Monitoring and Assessment Section Manager**

FROM: **Tim Michael, Interim QA Officer**

DATE: **November 30, 2009**

SUBJECT: **SEV190 Dataset Acceptability (Van Horn Sonde Dataset)**

Summary

From 6/02/06 to 12/31/07, David Van Horn (principal investigator), collected continuous water quality data from the Middle Rio Grande as part of a USBR funded research project. The final dataset of the project is publically available on the Sevilleta Long Term Ecological Research (LTER) website and is identified as "Rio Grande Sonde Data, SEV190." The dataset includes measurements of five parameters (temperature, pH, turbidity, dissolved oxygen and conductivity) in the Rio Grande using a YSI 6920 sonde that recorded a value every 15 minutes.

Details on the project can be found at http://sev.lternet.edu/project_details.php?id=SEV190.

Attached are two documents associated with the project: *Surface Water Quality Study and Continuous Water Quality Monitoring Network for the Middle Rio Grande, Work Plan Task 4, Statement of Work* (the *SOW*) and a document identified as *Metadata*. The *SOW* includes a Quality Assurance Project Plan with two sections: (1) Field Calibration of YSI 6920 Sondes and (2) Data Review, Validation, Verification, and Usability. The *SOW* also includes calibration tips for the parameters of conductivity (page 11), pH (page 12), DO (page 15) and turbidity (page 17). Calibration tips for temperature are not included. Calibration worksheets are included on pages 22 and 23.

At your request, I have reviewed the documentation associated with the sonde dataset to determine if the dataset meets SWQB QA/QC requirements. Specifically I addressed two issues: (1) is there documentation of QA/QC procedures that, at a minimum, meet the QA/QC requirements described in the SWQB's most recent QAPP; and (2) is there reasonable evidence and/or assurance that these procedures were followed.

My review indicates that the dataset meets SWQB QA/QC requirements based on (1) the QA/QC procedures as outlined in the work plan (calibration worksheets, best practices for calibration and maintenance, etc.) are consistent with SWQB sonde data collection procedures and requirements, and (2) in reviewing the *Metadata* document and the data files themselves there is sufficient evidence (such as indications of approximately biweekly field calibration, QA data flags, etc.) that the procedures were implemented as intended.

Basis

According to the SWQB Assessment Protocol (NMED/SWQB 2009a),

> "To be considered for development of the Integrated List, data must, at a minimum, meet the QA/QC requirements described in the SWQB's most recent QAPP. Analytical methods used must meet the requirements specified in the analytical methods section of the QAPP and the methods of data collection must be the same as, or comparable to, those included in the State's Standard Operating Procedures (SOPs) (NMED/SWQB 2007) referenced in the current QAPP. Additionally, the QC criteria used to verify and validate the data must be the same, or similar, to those listed in the SWQB Field Quality Control Sampling Summary and the SWQB Data Verification and Validation Procedures detailed in the QAPP."

Current SWQB QAPP (NMED/SWQB 2009b) requirements are found in Section 2.7, Instrument/Equipment Calibration and Frequency, Section 2.8, Data Acquisition Requirements and Appendix B, SWQB Data Validation and Verification Procedures. Excerpts are below (the most pertinent phrases are italicized):

Section 2.7: Instrument Calibration and Frequency:

> *A calibration log shall be kept for each instrument.* SWQB staff routinely enter dates of calibration, calibration methods used, and any other pertinent data, e.g., erratic instrument behavior in the logbook. A summary of calibration for field equipment is provided in Appendix D. Additional calibration and instrument information can be found in the SOPs (NMED/SWQB 2007) and the manufacturer's instruction manual.

Section 2.8 Data Acquisition Data Acquisition Requirements:

> Water quality data from municipalities, national laboratories, citizen's groups, universities, etc., may also be used by the SWQB, *provided that all data submitted are accompanied by the QAPP (or equivalent) under which it was collected*. SWQB will evaluate the QA/QC information and determine if and how it can be used. *To be considered for assessment purposes and TMDL development, data must, at a minimum, meet the QA/QC requirements described in this document*, with particular emphasis on ensuring that the analytical methods used were the same as those included in Appendix E of this QAPP, that *the methods of data collection were the same as or comparable to those included in the SOPs referenced throughout this QAPP*, and that the QC criteria used to verify and validate the data were the same as those listed in Table 2.4 and Appendix B.

Appendix B states that *for data validation, equipment/validation logs should be available*.

The requirements are summarized below:

> 1. All data submitted should be accompanied by the QAPP under which it was collected.
> 2. Data must meet the QA/QC requirements of the SWQB QAPP.
> 3. A calibration log should be kept for each instrument and be available and used for data validation.
> 4. Because the QAPP references the Bureau SOPs, the data collection methods should meet the requirements of SOP Section 5.6, Sonde and Thermograph Calibration and Maintenance.

Requirement 1.

The data is accompanied by the *SOW* that includes a Quality Assurance Project Plan with two sections: (1) Field Calibration of YSI 6920 Sondes and (2) Data Review, Validation, Verification, and Usability. The QAPP is acceptable.

Requirement 2.

The documentation provided in the QAPP outlines calibration plans that are consistent with SWQB's QAPP for this type of data collection and provides a worksheet to collect the necessary data for the QA/QC procedures outlined in the QAPP. SWQB has written communication with Mr. Van Horn indicating that he can provide calibration records if needed. In addition, a review of the metadata shows QA flags are provided in columns 12-16 of the dataset and a brief description of the QA/QC procedures is provided with the metadata. This provides reasonable evidence QA/QC procedures were followed as outlined and that the data properly validated, and therefore meet the QA/QC requirements of the SWQB QAPP.

Requirement 3.

The information provided under Requirement 2, specifically the calibration worksheet found on pages 22 and 23 of the QAPP, indicates that the necessary metadata, including calibration logs and validation records, are available.

Requirement 4.

The evidence provided under Requirement 2, specifically the calibration procedures found in pages 11-17 of the QAPP, is sufficient to indicate that the calibration procedures and data collection methods described in the *SOW* and *Metadata* meet the requirements of the Bureau SOP. In addition, the dataset contains 1-hour periods approximately every two weeks were the data are flagged. While not identified in the comment field specifically as recalibrations, it is likely that these represent periods of field recalibration and are consistent with the procedures described in the *Metadata* document (*Sondes were recalibrated in the field every two to four weeks following manufacturers specifications*) and SOW providing reasonable assurance that these procedures were followed.

References

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Attachment 1

Surface Water Quality Study and Continuous Water Quality Monitoring Network for the Middle Rio Grande

Work Plan:

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Sponsoring Agency: University of New Mexico

Project Types: Monitoring, Research

Purpose/Objectives:

The general purpose of this proposed research and monitoring program is to extend efforts begun in September 2005 to assess temporal and spatial trends in water quality of the Middle Rio Grande. These trends are important for a variety of reasons including 1) human populations will soon be dependent on Middle Rio Grande water for municipal use, 2) river water can contaminate groundwater through groundwater/surfacewater interactions, 3) river water quality may negatively affect threatened or endangered aquatic organisms, and 4) river water quality can affect downstream reservoir water quality. Data collected during the first year of this project demonstrate water quality in the Rio Grande is spatially and temporally variable and is strongly influenced by changes in river discharge. Multiple years of data collection are necessary to provide an accurate assessment of the response of Rio Grande water quality to inter-annual climate variability and the resulting changes in river flow.

The water quality studies will support the following specific activities:

1. **Upper Rio Grande Water Operations Model (URGWOM)** – data planning and collection for water-quality modeling;
2. **Middle Rio Grande Bosque Initiative** – implement recommendations of the Middle Rio Grande Ecosystem: Bosque Biological Management Plan (Crawford et al., 1993):
    a. Recommendation #3 -- Reintroduce the dynamics of surfacewater/groundwater exchange, manage groundwater withdrawal, and restrict contamination;
    b. Recommendation #5 -- Protect and enhance surfacewater quality; and
    c. Recommendation #18 -- Develop a coordinated program to monitor biological quality (with emphasis on the diversity and abundance of native species) and ecosystem integrity (with emphasis on restoring the functional connection between the river and riparian zone) of the Middle Rio Grande ecosystem; and
3. **Biological and Conference Opinions on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, New Mexico (U.S. Fish and Wildlife Service, 2003)** – implement Reasonable and Prudent Alternative (RPA) elements dealing with surface- and groundwater quality within the Middle Rio Grande, including:
    a. Water-quality rationale used in determining elements of the RPA;
    b. RPA Water-Quality Element DD – With the increased emphasis and importance of the Angostura Reach for silvery minnow conservation, it is imperative that the

addition of treated wastewater to the river provides water-quality conditions protective of silvery minnow.

c. RPA Water-Quality Element EE – Action agencies, in coordination with parties to the consultation, shall provide funding for a comprehensive water-quality assessment and monitoring program in the Middle Rio Grande to assess water-quality impacts on the silvery minnow. This assessment and monitoring program should use available data from all sources.
d. Reasonable and Prudent Measures (RPM) under Conservation Recommendations 4) – Conduct Studies to determine how effluents from waste water treatment plants (WWTPs) mix with water from the Rio Grande at various discharges; and 14) – Monitor fluctuations of groundwater in the shallow and deep aquifers to better understand groundwater/surface water relationships.

The first objective of this proposal is to continue the collection of water quality data using continuous measuring probes and instruments along the Albuquerque reach of the Middle Rio Grande. These continuous data will provide valuable information pertaining to diurnal, episodic, and seasonal changes in water quality. We propose to continue collecting measurements of dissolved oxygen, temperature, conductivity, pH, and turbidity at four locations along the Rio Grande selected and instrumented during the first year of the study. The list of sites for the continuous sampling is found under Project Coordinates.

The second objective is to continue the dissemination of the data collected in objective 1 to the general public via the internet. This will be accomplished through posting the data on the Sevilleta LTER website.

Background:

The role of various point and non-point sources of nutrients and solutes is of great concern to the biota within the river and to the water quality of major reservoirs such as Abiquiu, Cochiti, and Elephant Butte. Water quality may also play a significant role in the declines of fish populations along the Middle Rio Grande. In 1999 the US Fish and Wildlife Service released the "*Rio Grande Silvery Minnow Recovery Plan*". This document cited water quality issues as one of the five factors that may be contributing to the decline in silvery minnow populations. The rapidly urbanizing character of the Middle Rio Grande places additional water quality stresses on the river, and occasional discrete sampling is inadequate to assess the extent of water quality problems in the river.

Spills of untreated or poorly treated wastewater can have serious deleterious effects on aquatic fish and invertebrates. Oxygen depletion from microbial respiration affects both sediments and river water. Toxic materials in the wastewater can have indirect, direct and synergistic effects on river biota. Toxicity testing by the U.S. Fish and Wildlife Service on fish species of the Rio Grande has shown copper and ammonia to be of concern (Joel Lusk and Kevin Buhl, personal communication, U.S. Fish and Wildlife Service). Ammonia is especially difficult to assess, as it is a toxic gas that is sensitive to river pH. Effectively treated wastewater converts ammonia (NH_3) and ammonium (NH_4^+) to nitrate (NO_3^-) with reduced toxicity to fish and aquatic invertebrates. Malfunctioning wastewater treatment plants, however, can discharge high concentrations of NH_3 and NH_4^+, dissolved and particulate organic matter, and microbial pathogens. Such releases also produce O_2 depletions, pH declines, turbidity increases, and conductivity fluctuations. Maintaining the network of continuously monitoring probes will

significantly improve river managers' ability to assess when and where such water quality impacts occur along the Rio Grande.

During the first eight months of data collection on the Rio Grande, discreet monthly sampling at 25 mainstem sites and quarterly sampling at 50 mainstem and tributary sites has demonstrated water quality is temporally and spatially variable. Point sources, particularly waste water treatment plants, are the largest contributors of nutrients to the system. Three instances of plants exceeding the 10 mg/l EPA limit for NO_3 were documented during tributary sampling. Waste water treatment plants also contribute significantly to conservative anion and cation concentrations in the Rio Grande; however, natural inputs from the Rio Salado and the Rio Puerco are as great or greater than the anthropogenic sources. River discharge appears to play a significant role in patterns of solute concentrations. During months with low to moderate river discharge solute concentrations immediately downstream of point sources are higher than at elevated flows due to decreased dilution of the inputs. However, solute concentrations decrease more rapidly during these low flow months as they move downstream than at high flows, probably due to increased interaction between the water column and the benthos, which allows for high rates of microbial processing. These findings demonstrate the importance of continued water quality sampling to further elucidate how water quality on the Rio Grande is affected by 1) continually changing natural and anthropogenic point source inputs 2) interannual climate variability and the resulting changes in river flow, and 3) episodic events such as releases of poorly treated effluent from waste water treatment plants.

Scope:

To assess the ability of rivers and streams to support aquatic life, the Environmental Protection Agency (EPA) suggests collecting information on the following water quality indicators: dissolved oxygen, temperature, conductivity, pH, and river flow. In addition, information on at least two biological communities or assemblages, habitat conditions, and landscape conditions (% agriculture, urban, etc.) are recommended. The second phase of this study will continue to provide detailed information on these water quality indicators using continuous monitoring probes deployed at four sites in the Albuquerque reach of the Rio Grande. Biological assemblages with potential bioassessment utility (e.g. benthic algae, benthic invertebrates, and fish populations) could be added to the sampling plan after the water quality program is well established.

We propose to continue measuring (data points collected at least every 15 minutes) dissolved oxygen, temperature, conductivity, pH, and turbidity throughout the year at four fixed locations. We have added turbidity to the EPA list of desired variables because untreated wastewater contains high concentrations of suspended solids. YSI probes measuring these indices are deployed and maintained in the vicinity of US Geological Survey gauges that monitor water flow in this reach of the Rio Grande. A complete list of deployment sites is included under project coordinates.

Dissemination of the data collected in the task described above will be accomplished by posting the data on the Sevilleta LTER website. David Van Horn, the UNM project coordinator, will work in conjunction with Kristin Vanderbilt, the Sevilleta data manager, to post all data on the website. The data will be posted on the current Sevilleta Hydro Data Base Page http://sevilleta.unm.edu/data/archive/water/hydrodb/. Data can be queried by site, date, analyte, and analyte concentration.

<u>Task 4</u> Statement of Work

Project Coordinates (For Continuous Monitoring Sites, See Table One for Synoptic Sites):

550 Bride in Bernalillo. Latitude 35°19'17", Longitude 106°33'30"

Alameda Blvd. *(in the vicinity of USGS Gage "Rio Grandè at Alameda Bride at Alameda" 08329918)* – Latitude 35°11'50", Longitude 106°38'30" NAD27, Bernalillo County, New Mexico, Hydrologic Unit 13020203.

Rio Bravo Blvd Bridge. Latitude 35°1'38", Longitude 106°40'23"

Isleta *(in the vicinity of USGS Gage "Rio Grandè at Isleta Lakes NR Isleta" 08330875)* – Latitude 34°56'49", Longitude 106°40'45" NAD27, Bernalillo County, New Mexico, Hydrologic Unit 13020203.

River Miles Affected:

The continuous sampling will be conducted at four sites spread out over approximately 50 river kilometers in the Albuquerque reach of the Middle Rio Grande.

Period of Performance:

The project will proceed for one year during this phase of funding.

Project Benefits:

In the long-term, this study will contribute to:

- Greatly improved water quality monitoring in urban and agricultural areas of the Middle Rio Grande,
- Understanding links between water quality and river biota,
- Development of viable strategies for river restoration to enhance water quality and improve conditions for native fish and aquatic invertebrate communities, and
- Parameterization of models concerning the fate of dissolved solutes in surface waters of the Middle Rio Grande.

Applicable recommendations identified in the Middle Rio Grande Ecosystem Bosque Management Plan:

The proposed research will provide background information essential to addressing recommendation five in the Middle Rio Grande Ecosystem Bosque Management Plan; 5) to protect and enhance surfacewater quality in the Middle Rio Grande. This project will provide a complete temporal baseline and will identify sources and sinks for water quality parameters such as solute concentrations, dissolved oxygen levels, and turbidity.

Quality Assurance Project Plan:

Field Calibration of YSI 6920 Sondes:

Sondes will be calibrated according to YSI protocols found in appendix A. The necessary frequency of calibration will be determined through a short term experiment in which two sondes will calibrated and deployed at one station and checked every 12 hours for drift with a freshly calibrated sonde.

Data Review, Validation, Verification, and Usability:

Data collected in this study will be reviewed, validated, verified, and checked for usability prior to dissemination. For the purposes of this project, validation includes all those procedures that would normally result in altering either the raw data or caution and reject flags in the raw data file. Verification involves procedures that may affect the use of the data (subsetting, averaging, and computation of derived parameters) in analyses and presentation and generally be based on verified data sets, whether primary or derived. See the criteria listed below for each of these procedures.

Data Rejection and Review:
A datum will be reviewed for rejection if:
1. An unusual event at the time of sampling or in sample handling could compromise its integrity,
2. The datum is ambiguously identified (e.g., inconsistency between sample number and date-time),
3. Analytical quality control exceeded limits,
4. The value is incompatible with those of other analytes in the same sample, or
5. The value is outside the range of plausible values.
A datum will also be reviewed for rejection if its value is outside the range of expected values. Note that even if a datum meets one of the above items that datum may still be retained in the dataset at the discretion of the task supervisor.

Data Validation and Verification Methods:
Data validation will include:
1. Proofreading and correction of all manual data entry
2. Automated consistency checks between sample number and date-time
3. Flagging for rejection of any data reported from batches that did not meet quality assurance control limits
4. Review field notebooks and quality assurance reports to assure that all data qualifiers (caution and rejection flags) have been entered into the sample label file.
5. Review of all caution flags for possible rejection
6. Review of samples for internal analytical consistency
7. Automated scanning for values within plausible ranges.

Data verification will include:
1. Review of data for outliers
2. Examination of consistency of individual observations with temporal and spatial trends
3. Review of chemical and hydrologic data for consistency with regional patterns

Usability:

Precision, accuracy, and completeness of analytical analyses will be computed and reported in the annual quality assurance report.

Health and Safety Plan:

Introduction:

As described above the objective of this project is to conduct water quality monitoring in the Middle Rio Grande involving the instillation and upkeep of continuous measurement probes affixed to bridge abutments. This task will require field workers to enter the Rio Grande either by wading during low flows or by boat during high flows. This health and safety plan will outline potential dangers that may be encountered in the field while performing this task and precautions that will be taken to mitigate these hazards.

General:

All tasks shall be performed with a minimum of two field workers in constant communication with each other. At least one field worker shall carry a cellular phone to be used in case of emergency. An emergency data sheet containing a list of phone numbers and addresses of nearby hospitals (noted as to which facilities stock anti-venom) and emergency facilities and a basic first aid kit will be carried at all times.

Water Safety:

All field technicians entering the river either by foot or on boat will be proficient swimmers. During low flows monitoring will be conducted by wading into the thalweg. The dangers inherent in this method include slipping, stepping into deep holes or channels in the river bed, and being swept downstream. During winter months chest or hip waders with felt soled boots will be used to prevent slipping on rocky substrates. In summer months either waders or river sandals will be used to prevent slipping. A wading rod will be used to check for deep holes as the field technicians move through the river toward the monitoring station. The river will not be entered on foot if there is any danger of being swept downstream.

During flows that are too high to wade but below flood stage an inflatable raft will be used to access the continuous monitoring sites and to collect grab samples. All personnel in the raft shall be equipped with a US Coast Guard certified inflatable personal flotation device. Field technicians will leave a float plan including sites to be visited and expected departure and return times with the lab coordinator in the Biology Annex Lab. No samples will be taken during flood stage.

Miscellaneous Safety:

Insect repellent will be worn at all times to prevent infection from mosquito and tick born diseases. When working in the Bosque, boots and long pants will be worn to reduce the risk of snake bites. In case of a snake bite the victim will be told to remain calm and as inactive as possible while being transported to the nearest hospital facility that stocks anti-venom. Heat stress will be avoided through the regular consumption of water and electrolytes and frequent rest during hot periods. Cold exposure will be prevented in the winter through the use of insulated waders and heat retentive non-cotton clothing.

References:

Crawford, C., A. Cully, R. Leutheuser, M. Sifuentes, L. White, and J. Wilber. 1993. Middle Rio Grande Ecosystem; Bosque Biological Management Plan. Middle Rio Grande Biological Interagency Team. U.S. Fish and Wildlife Service. Albuquerque, New Mexico. 291 pp.

U.S. Fish and Wildlife Service. 2003. Biological and Conference Opinions on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, New Mexico, March 17, 2003. 128 pp.

6884 NITRATE PROBE

STANDARD	OFFSET	SLOPE
1 mg/L	150 mV +/- 25	110 mV
100 mg/L	40 mV	

6883 AMMONIUM PROBE

STANDARD	OFFSET	SLOPE
1 mg/L	0 mV +/- 50	110 mV
100 mg/L	110 mV	

6882 CHLORIDE PROBE

STANDARD	OFFSET	SLOPE
10 mg/L	200 mV +/- 25	110 mV
1000 mg/L	100 mV	

Installation of Field Replaceable probes for 6-Series Products

Installation of the Temperature/Conductivity Combo probe, Dissolved Oxygen probe, pH and/or pH-ORP Combo probe and optical probes for 6-Series Products (Multi-Parameter Instruments). If the technique of installing these probes is not performed correctly, the outcome can be damaged threads in the probe port and/or probe being installed.

To prevent such damage, there is a procedure that must be followed to ensure proper installation of these field replaceable probes:

1. Lightly grease the o-rings on the probe.
2. Insert the probe into the correct port and gently rotate the probe until you feel the connector engage.
3. Now push the probe in towards the bulkhead until you feel the o-ring seat in its bore. You will experience some resistance as you push the probe inward, this is normal.
4. Once you feel the o-ring seat, gently rotate the stainless steel probe nut clockwise with your fingers **DO NOT** use the tool.
5. The nut must be seated by hand, if the nut is difficult to turn, **STOP**, back off and attempt again. If the nut is difficult to turn, it may be cross threading. Damage to your instrument may occur if you force the parts together.
6. The nut will seat flat against the bulkhead and rotate easily when the parts are properly aligned. Use the tool to snug up the nut so it cannot come loose.
   DO NOT over tighten.

Note: Once the nut is seated by hand, the o-ring seal has been made and the assembly is waterproof, excess force on the nut will not make a better seal!

Same process will apply to Optic probes, but the seal is a compress seal; therefore, while still using the same probe installation tool ONLY, apply some torque pressure to compress the seal. DO NOT use any other device to gain extra torque leverage this will damage the probe housing.

Removal of Field Replaceable probes for 6-Series Products

1. Remove any excess moisture from Sensor area.
2. Keep Sonde in a horizontal position at **ALL** times during probe removal process.
3. Make sure probe body **does not** move (turn) when attempting to turn SS nut.
4. Once SS nut is completely loose, pull probe straight out.
5. Once probe is out of Sonde, hold Sonde body so probe ports are pointing downward and shake Sonde to remove any excess moisture.
6. With Sonde still in a downward position using a small cloth (Kim-wipe), remove any additional excess moisture that may still be in port thread area.
7. Examine probe port to be sure all moisture has been removed before taking Sonde from **downward** or **horizontal** position.

If moisture is visible on the connector pins, put a small amount of isopropyl alcohol in the port, then pour out and dry out with can of dry air.

CALIBRATION TIPS - *CONDUCTIVITY*

Note: Before beginning verify the accuracy of your sondes temperature probe with a traceable thermometer or other reference. Temperature compensation is used in almost every sonde measurement so its accuracy should be verified and recorded each time the sonde is calibrated.

1. Calibrate conductivity first; avoid any contamination of the standard.

2. Never calibrate with conductivity standards that are less than 1.0 ms/cm, these standards are easily contaminated by residual DI water and even RF noise.

3. Pre-rinse the sensors with a small amount of the calibration standard to eliminate contamination.

4. Insure that the conductivity probe is completely submerged in standard. The hole in the side of the probe must be under the surface of the solution and not have any trapped bubbles in the opening.

5. If the sonde should report **"Out Of Range"**, investigate the cause. Never override a calibration error message without fully understanding the cause. Typical causes for error messages are incorrect entries. For example, entering 1000 microsiemens instead of 1.0 millisiemens (Note: the sonde requires the input in millisiemens). Low fluid level and/or air bubbles in the probe cell can also cause error messages to appear.

6. When the calibration has been accepted, check the conductivity cell constant which can be found in the sonde's **"Advanced Menu"** under **"Cal Constants"**. The acceptable range is 5.0 +/- 0.50. Numbers outside of this range usually indicate a problem in the calibration process or a contaminated standard was used.

CALIBRATION TIPS – ***pH***

1. Go to the sondes report menu and turn on the pH mv output. This will allow the sonde to display the millivolts or the probes raw output, as well as, the pH units during the calibration process.

2. Recondition the probe if a slow response in the field has been reported. The procedure can be found in your manual under the "**Sonde Care and Maintenance Section**".

3. In most cases, a two point calibration is all that is required. Bracket the expected in-situ pH values; use the three point calibration if the measurement area pH is unknown.

4. Calibrate the pH. Insure that the temperature probe is in solution with the standard, record the pH millivolts at each calibration point.

5. The millivolts help tell us the present status of the probe; a good set of numbers to use are as follows:

Buffer 7	= 0	+/- 50 mv
Buffer 4	= +177	from 7 buffer MV value
Buffer 10	= -177	from 7 buffer MV value

The ideal numbers when a probe is new are close to the 0 and 177 numbers. As the probe begins to age, the numbers will move and shift.

NOTE: After recording the pH millivolts for the calibration points, you must determine the slope of the sensor. This is done by determining the difference between the two calibration points that were used, for example, if we recorded a -10 mv for buffer 7 and a –187 for the 10 buffer then the slope would be 177. The acceptable range for the slope is ≈ 165 to 180. Once the slope drops below a span of 165, the sensor should be taken out of service.

WARNING: Never override any calibration errors or warnings without fully understanding the reason for the message.

Proper storage of the sensor when not in service will greatly extend the life of the probe.

CALIBRATION TIPS – ***ORP/REDOX***

1. The ORP and PH sensors are combined on all current YSI sondes. You must calibrate the PH sensor first and insure that it is working properly before you calibrate the ORP. If the PH probe will not calibrate for any reason then the ORP has been disabled as well.

2. Reference the "Care, Maintenance & Storage" Section for reconditioning tips and cleaning instructions.

CALIBRATION CHART

Temperature Celsius	Zobell Solution Value, MV
-5	270.0
0	263.5
5	257.0
10	250.5
15	244.0
20	237.5
25	231.0
30	224.5
35	218.0
40	211.5
45	205.0
50	198.5

NOTE: All ISE sensors, i.e. Ammonium, Nitrate, Chloride, requires the pH and temperature probe to be in solution during calibration.

CALIBRATION TIPS – ***DEPTH***

1. Use syringe from Maintenance Kit; **this is the only tool to be used on the depth sensor.**
2. If further cleaning is required, soak in warm soapy tap water, then try syringe again.
3. Calibrate in air to zero.
4. For more accurate reading in reference to WQ sensors; apply offset in calibration.
5. Record Pressure offset in Advance/Cal Constants Menu (Per Calibration Sheet)
6. **Never accept an "Out of Range"**

CALIBRATION TIPS - *DISSOLVED OXYGEN*

UNATTENDED MONITORING PREPARATION

1. Inspect the DO probe anodes and recondition using the 6035 reconditioning kit if they are darkened or gray in color.

2. **O-ring** replacement; the frequency of replacement of the o-ring that is used to secure and seal the membrane will depend greatly on the condition of the sample under study. For example, water that is contaminated with measurable level of hydrocarbons will require a more frequent replacement of the o-ring due to breakdown in the o-ring material. As a general rule, YSI recommends that replacement of the o-ring should be performed every 30-60 days, or before each long term deployment.

3. Install a new membrane, making sure that it is tightly stretched and wrinkle free. **CAUTION**: If you remove the DO probe from the sonde, be sure to inspect the probe port for moisture. Remove any moisture droplets from the connector area. Also verify that the probe is clean and dry with a small amount of silicone grease applied to the o-ring before it is reassembled. Note: DO membranes will be slightly unstable during the first 3 to 6 hours after they are installed; it is suggested that the final calibration of the DO sensor take place after this time period.

4. Go to the sondes "**Report**" menu and enable the "**DO Charge**". Now go to the "**Run**" menu and start the sonde in the "**Discrete Run**" mode at a 4 second rate, allow the sonde to run (burn in) for 10 minutes. Record the DO Charge after about 5 minutes. The number should be 50 +/- 25.

5. After the burn-in is complete, go to the sondes advance menu and confirm that the RS-232 auto sleep function is enabled. If the sonde is to be connected to a SDI-12 data logger then the SDI-12 auto sleep must be enabled as well. Wait 60 seconds before proceeding to step 6.

6. Start the probe in the "**Discrete Run**" mode at a 4 second rate and record the first 10 DO % numbers on paper, the numbers must start at a high number and drop with each four second sample, example: 110, 105, 102, 101.5, 101.1, 101.0, 100.8, 100.4, 100.3, 100.1. It does not matter if the numbers do not reach 100%, it is only important that they have the same high to low trend. If

you have a probe that starts at a low number and steadily climbs upwards then the sensor has a problem and it must not be used. **Note**: Initial power up of the sonde can make the first two DO % samples read low, disregard low numbers in this position.

7. The probe is now ready to be calibrated. **Do not allow water to touch the membrane or any water drops on the membrane; also, make sure the temperature sensor is dry, (small stainless steel looking stem on 6560, Temperature/Conductivity probe.** Set the sonde into the calibration cup with approximately 1/8 inch of water. You may also use a wet towel method if you prefer. The sonde must now sit in this saturated environment for at least 10 minutes before the DO calibration can begin. **Warning: The sonde must be idle or not in the "RUN" mode for 5 minutes prior to starting the DO calibration.** Calibrate the sonde in DO % being sure to enter your local barometric pressure in **mm/hg**.

8. When the calibration is completed go to the sondes "**Advanced Menu**" and then to the "**Cal Constants**" and record the "**DO Gain**". The gain should be 1.0 with a Range of 0.7 to 1.5. The probe should now be successfully calibrated and ready to prepare for the unattended study. Like with the other parameters any warning messages displayed by the sonde during the calibration are a cause for concern and must be investigated before deploying the sonde.

DISCRETE MONITORING PREPARATION (SPOT SAMPLING, PROFILING, ETC.)

All information above applies with the exceptions:

1. RS-232 auto sleep function is disabled.
2. A long warm-up time of the DO probe is required. Usually 4 – 5 minutes to confirm DO probe is completely warmed up and has stabilized.

CALIBRATION TIPS – *TURBIDITY-Model 6136 Probe*

Note: The calibration of all YSI turbidity sensors must be done with either YSI distributed standards, Hach StablCal, Diluted Hach 4000 NTU formazin or standards that have been prepared according to the instructions in Standard Methods (Section 2130B). Standards from other vendors are *NOT* approved, and their use will likely result in a bad calibration and incorrect field readings. Please refer to the turbidity calibration section of your manual for more information.

1. The first step is to confirm that the turbidity probe is functioning properly. Confirm that the wiper is parking correctly. It should be positioned at approximately 180 degrees opposite of the optics. The wiper should reverse direction during the wipe cycle. And the output of the probe should increase when you place your finger in front of the optics. If the wiper does not park correctly or reverse direction then make sure that the bottom edge of the wiper are clean and free of mud, sediment, or other fouling, replace the wiper with the spare, if needed. If the probe does not show an increase in output and/or the wiper does not park correctly, then you must stop the calibration and determine the reason for the fault.

2. Calibrating turbidity is best done in a lab environment; calibrations done in the field can result in errors. It is better to post-calibrate a sonde back in the lab than to attempt a calibration of an optical probe in the field, especially if you are working out of a small boat or in less than clean conditions.

3. Never use opaque plastic beakers or containers for the calibration standards. Opaque colored plastics can cause reflections from the light source resulting in errors. Use of the supplied calibration/storage cup with its black endcap is highly recommended. Glassware can also be used, but due to the possibility of light source reflection, the sensor guard must be installed on the sonde and beaker placed on a black counter top. Do not use small containers like 35 mm film storage containers. For your calibration, a minimum distance of 3.0

inches is required from the probe face to bottom of the calibration chamber.

4. Always insure that the all submerged parts of sonde and the wiper are clean before beginning any turbidity calibration. Sediment or other contaminants may come off the instrument and wiper and contaminate the standard.

5. Always start with the zero (0) NTU standard first. Pour the 0 NTU standard into the calibration cup - pour down the side so you do not aerate the sample. Set your sonde on top of the calibration cup (do not engage the threads). Verify that there are no air bubbles on the probe face; then run the wiper at least once before accepting the first point.

NOTE: The standard YSI calibration cup is slightly shorter than the sondes sensor guard. This shorter cup minimizes the use of standards when calibrating the sensors. In deployments where very low turbidity readings are expected, the sonde should be spaced off of the calibration cup two inches. The sonde may report a slightly negative reading (typically less than -1.0 NTU) when calibrated with the sonde resting on the calibration cup.

6. Calibrate the second point typically 123 NTU - again wipe the probe at least once before pressing the enter button. NOTE: Never override a calibration error message without fully understanding the cause of the problem. Calibration error messages usually indicate that a problem exists that will result in incorrect field readings.

NOTE: For the YSI prepared AMCO-AEPA standards, the value entered by the user during the calibration protocol is DIFFERENT depending on which YSI turbidity sensor (6026 gray body or 6136 black body) is being calibrated. The part numbers for the YSI standards and their calibration values are listed by probe below. This applies to the YSI standards ONLY, all other standard will be per the value they are made up to e.g. 10 NTU formazin is 10 NTU for either probe.

YSI Part Number	6026 Value	6136 Value
608000	**0 NTU**	**0 NTU**
607200	**10.0 NTU**	**11.3 NTU**
607300	**100.0 NTU**	**123.0 NTU**
607400	**800.0 NTU**	**1,000.0 NTU**

CALIBRATION TIPS - *CHLOROPHYLL*

1. Chlorophyll calibrations can be quite involved. Before you begin please review the "**Calibration"** and **"Principles of Operation**" sections of your manual.

2. The chlorophyll sensor does require a single point calibration prior to use. To set the zero use the single point (ug/l) calibration option, place the probe in its calibration cup in clear deionized or distilled water, run the wiper 1-2 times, then press enter when the reading is stable. This single point calibration will set the zero and use the factory default calibration which will yield a +/- 25% accuracy for any given probe.

3. Calibrating the sonde using Rhodamine B or Rhodamine WT dyes will allow the user to track potential drift over the life of a deployment or field study. Neither of these dyes directly correlates to Chlorophyll units. The purpose of the dye calibration is to check for sensor drift at the end of the deployment.

4. True calibration can only be done by post processing the data against samples that have been analyzed by extractive analysis.

5. For best results, use only freshly analyzed or prepared chlorophyll standards.

Slow response from pH and/or ORP readings in standards (buffers and Zobell solution), or slow response reported from the field.

The most common cause of slow response is a blocking of the pH reference junction.

There is a Technical Notes on probe cleaning and reconditioning available on the YSI web site. These Technical Notes can be reviewed for proper instructions on probe cleaning and reconditioning.

Any of the cleaning procedures may be sufficient, but soaking the probe in a 1 to 1 dilution of chlorine bleach has proven to be the most affective and recommended. NOTE: If an application is where hard water is being tested, then the most affective cleaning method may be using the 1M (HCl).

NOTE: If doing both cleaning methods, which sometimes is required, make sure to follow the caution mentioned about proper rinsing so there is no mixing of acid and bleach.

After the cleaning and rinsing procedure has been completed, testing of the probe would be required to confirm quick response has been achieved. To do a proper response test requires two steps.

1. Place the probe in buffers and/or Zobell solution to confirm quick response. If response is effectively instantaneous when transferring the probe between pH buffers or placing the probe into Zobell solution, then move to the second step.
2. Place the sensor in a beaker of tap water that is of a known pH value based on previous test. The pH value should be stable within 0.05 units in 1 minute and should be within 0.2 pH units of the correct value. If the exact pH of the tap water is not know, then when the probe is placed in the tap water the response should be within approximately 1 minute of a stable and realistic value. NOTE: To maintain a stable value of the tap water, the water should be aerated for 20 minutes before starting the second test and during this test to keep the CO_2 level stable; thus, keeping the pH level stable.

GLP FILE EXAMPLE

```
m/d/y hh:mm:ss      S/N                 Type    Value
08/23/2001 17:07:50 00003001    Conductivity gain 1.000000
08/23/2001 17:07:50 00003001              DO gain 1.000000
08/23/2001 17:07:50 00003001        DO local gain 1.000000
08/23/2001 17:07:50 00003001  pH gain (pH-7)*K/mV -5.05833
08/23/2001 17:07:50 00003001   pH offset (pH-7)*K 0.000000
08/23/2001 17:07:50 00003001        ORP offset mV 0.000000
08/23/2001 17:07:50 00003001         TDS constant 0.650000
08/23/2001 17:07:50 00003001          Turb Offset 0.000000
08/23/2001 17:07:50 00003001              Turb A1 500.0000
08/23/2001 17:07:50 00003001              Turb M1 500.0000
08/23/2001 17:07:50 00003001              Turb A2 1000.000
08/23/2001 17:07:50 00003001              Turb M2 1000.000
08/23/2001 17:07:50 00003001           Chl Offset 0.000000
08/23/2001 17:07:50 00003001               Chl A1 100.0000
08/23/2001 17:07:50 00003001               Chl M1 100.0000
08/23/2001 17:07:50 00003001               Chl A2 200.0000
08/23/2001 17:07:50 00003001               Chl M2 200.0000
08/23/2001 17:07:50 00003001         Fluor Offset 0.000000
08/23/2001 17:07:50 00003001              DO gain 1.103424
08/23/2001 17:07:50 00003001        DO local gain 1.000000
```

The data in the display shows a new sonde (Circuit Board # 00003001) which has just had its dissolved oxygen sensor calibrated. Note that the initial values for all parameters are the default settings. Only the last two entries (DO gain and DO local gain) have been affected by the calibration of the oxygen sensor. If the conductivity sensor is now calibrated, the new conductivity gain value is now automatically appended to the record as shown below:

```
m/d/y hh:mm:ss      S/N                 Type    Value
08/23/2001 17:07:50 00003001    Conductivity gain 1.000000
08/23/2001 17:07:50 00003001              DO gain 1.000000
08/23/2001 17:07:50 00003001        DO local gain 1.000000
08/23/2001 17:07:50 00003001  pH gain (pH-7)*K/mV -5.05833
08/23/2001 17:07:50 00003001   pH offset (pH-7)*K 0.000000
08/23/2001 17:07:50 00003001        ORP offset mV 0.000000
08/23/2001 17:07:50 00003001         TDS constant 0.650000
08/23/2001 17:07:50 00003001          Turb Offset 0.000000
08/23/2001 17:07:50 00003001              Turb A1 500.0000
08/23/2001 17:07:50 00003001              Turb M1 500.0000
08/23/2001 17:07:50 00003001              Turb A2 1000.000
08/23/2001 17:07:50 00003001              Turb M2 1000.000
08/23/2001 17:07:50 00003001           Chl Offset 0.000000
08/23/2001 17:07:50 00003001               Chl A1 100.0000
08/23/2001 17:07:50 00003001               Chl M1 100.0000
08/23/2001 17:07:50 00003001               Chl A2 200.0000
08/23/2001 17:07:50 00003001               Chl M2 200.0000
08/23/2001 17:07:50 00003001         Fluor Offset 0.000000
08/23/2001 17:07:50 00003001              DO gain 1.103424
08/23/2001 17:07:50 00003001        DO local gain 1.000000
08/23/2001 17:23:13 00003001    Conductivity gain 0.979114
```

Note that the default value of the conductivity "Value" is 1.00 in the .glp format shown above. This relative number is equivalent to a real cell constant of 5.00 which is provided in the **Advanced|Cal Constants** and is described in Section 2.9.8. All other values in the .glp file are equivalent to those shown in the **Advanced|Cal Constants** menu.

Task 4 Statement of Work

CAUTION: Calibration records for all sensors will automatically be stored in the .glp file until the **Delete All Files** command is used from the **File** menu. However, if the Delete command is issued, all files, including the .glp (calibration record) file will be lost. Therefore, it is extremely important to remember to upload the .glp file to a PC or a 650 Display/Logger prior to deleting files from the sonde. See Section 2.9.3 for instructions on the upload and viewing of the .glp file.

CALIBRATION WORK SHEET

Date of Calibration: _____ Technician: _____

DO membrane changed? Y N Note: Should wait 6 to 8 hours before final DO calibration, run sensor for 15 minutes in Discrete Run to accelerate burn-in.

Turbidity wiper changed? Y N Wiper parks ≈ 180° from optics? Y N Note: Change wiper if probe will not park correctly.

Chlorophyll wiper changed? Y N Wiper parks ≈ 180° from optics? Y N Note: Change wiper if probe will not park correctly.

Record battery voltage: _____ Record Calibration Values

Actual

After calibration
Record the following diagnostic numbers after/during calibration.

Conductivity cell constant _____ Range 5.0 ± .5 Conductivity _____ _____

pH MV Buffer 7 _____ Range 0 MV ± 50 MV pH 7 _____ _____

pH MV Buffer 4 _____ Range +177 from 7 buffer MV pH 4 _____ _____

pH MV Buffer 10 _____ Range –177 from 7 buffer MV pH 10 _____ _____

NOTE: Span between pH 4 and 7 and 7 and 10 millivolt numbers should be ≈ 165 to 180 MV ORP _____ _____

NOTE: Check response time in buffer change & in Tap Water

Depth _____ _____

DO charge	_____	Range 50	± 25	Turbidity	_____
DO gain	_____	Range 1.0	.7 to 1.5	Turbidity	_____
				Chlorophyll	_____
Pressure Offset	_____	Range –14.7	± 6 (non-vented)	Chlorophyll	_____
Pressure Offset	_____	Range 0	± 6 (vented)	DO	_____
ORP mV Offset	_____	Range 0	± 100		

DISSOLVED OXYGEN SENSOR OUTPUT TEST (after DO calibration probe in saturated air)

The following tests will confirm the proper operation of your DO sensor. The DO charge and gain must meet spec before proceeding.

610/650– Turn off the 610/650, wait 60 seconds. Power up 610/650 and go to the Run mode, watch the DO % output; it must display a positive number and decrease with each 4 second sample, eventually stabilizing to the calibration value in approximately 60 to 120 seconds. **Note:** You can disregard the first two samples they can be affected by the electronics warm-up.

PC – Stop discrete and unattended sampling. Confirm that auto-sleep RS-232 is enabled (found in Advanced Menu under Setup). Wait 60 seconds. Start discrete sampling at 4 seconds. Watch the DO % output, it must display a positive number and decrease with each 4 second sample, eventually stabilizing to the calibration value in approximately 60 to 120 seconds. **Note:** You can disregard the first two samples they can be affected by the electronics warm-up.

The **ACCEPT/REJECT** criteria as follows:
The DO output in % must start at a positive number and decrease during the warm up. Example: 117, 117, 114, 113, 110, 107, 104, 102, 101, 100, 100. Should the output display a negative number or start at a low number and climb up to the cal point, the probe is rejected and must not be deployed.

_____ **ACCEPT**

_____ **REJECT**

Notes

Attachment 2

Excerpts from Metadata

1] Data Set Code: SEV190

2] Data Set Title: Rio Grande Sonde Data

3] Abstract: Human populations in Colorado, New Mexico and Texas depend on the Rio Grande for municipal water, agricultural irrigation, and recreation. The Rio Grande and its riparian corridor also support thousands of species of plants, invertebrates and vertebrates, some of which include over 300 species of migratory birds and the endangered Rio Grande silvery minnow and southwestern willow flycatcher. Eutrophication and salinization are the two most important types of water quality degradation which negatively impact the human and nonhuman biological communities in this water poor region. In spite of their significance, few published studies have investigated anthropogenic and natural sources of nutrients and dissolved solids to the Rio Grande. This study investigated the patterns and trends of nutrients and dissolved solids in the Middle Rio Grande (MRG) on a monthly basis from September 2005 – January 2008. During all months, wastewater treatment plants were the major source of nutrients to the MRG. Under high flow conditions, nutrient levels remained elevated for 260 river kilometers below the wastewater inputs. During months when significant portions of the river flow were diverted for irrigation, nitrate and phosphate were removed from the MRG and concentrations at the downstream end of the reach were returned to levels comparable to the un-impacted northern reach of river. Dissolved solids were added to the river by both wastewater and saline tributary inputs. Both anthropogenic and natural inputs of dissolved solids were found to affect water quality in the MRG. Continuous real-time measurements of temperature, pH, turbidity, dissolved oxygen, and conductivity also were initiated at four sites above and through the urban reach of the City of Albuquerque. Preliminary results show increasing turbidity and dissolved oxygen depletions associated with storm runoff from urban areas.

4] Purpose: The objectives of this study were to: 1) conduct a detailed assessment of the temporal and spatial trends in water quality of the MRG, 2) determine sources of eutrophication and salinization along the MRG, 3) estimate instream nutrient processing and retention, 4) calculate the effects of urbanization on dissolved oxygen and stream metabolism values in the MRG, and 5) provide baseline data for future water-quality monitoring and assessment in the MRG.

6] When the samples/data were collected: (Enter as a single date -or- range of dates in format mm/dd/yyyy or mm/yyyy or yyyy)

Begin Date: 06/01/06
End Date: 12/31/08

7] Who is Involved With the Samples/Data:

Principle investigator 1:
GivenName: David
SurName: Van Horn
Delivery Address: Department of Biology, 167 Castetter Hall, MSC03 2020
1 University of New Mexico
City: Albuquerque

State: NM
ZipCode: 87131-0001
Email: vanhorn@unm.edu
Phone: 505.277.9164

Principle investigator 2:
GivenName: Cliff
SurName: Dahm
Delivery Address: Department of Biology, 167 Castetter Hall, MSC03 2020
1 University of New Mexico
City: Albuquerque
State: NM
ZipCode: 87131-0001
Email: cdahm@sevilleta.unm.edu
Phone: 505.277.2850

9] How the Data were Collected:

{Methods}
* Experimental Design: Four sites were chosen within the Albuquerque reach for continuous measurement of five water-quality field parameters; temperature, conductivity, pH, turbidity, and dissolved oxygen. Sites were chosen to provide instrument stability and a gradient of urban influence with the most northern site located above urban wastewater inputs and the southern site below the Bernalillo, Rio Rancho, and Albuquerque wastewater treatment plants.

* Sampling Design: Readings were collected every fifteen minutes.

* Field methods: Sondes were recalibrated in the field every two to four weeks following manufacturers specifications.

* Laboratory Procedures:

{Instrumentation}

* Instrument Name: Multi-Parameter Water Quality Sonde
* Manufacturer: Yellow Spring Instruments
* Model Number: YSI 6920

* Instrument Name:
* Manufacturer:
* Model Number:

*Instrument Name:
* Manufacturer:
* Model Number:

10] Variable Descriptions:

Variable 7:
*Name: Temperature
*Label: Water Temperature
*Definition: Temperature of the water
*Measurement Scale: Interval
*Units of Measure: Celsius
*Precision of Measurements: 0.01
*Range or List of Values: 0-100

*Number Type: Real
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 8:
*Name: Specific_Conductivity
*Label: Water specific conductance
*Definition: Specific conductance of the water
*Measurement Scale: Ratio
*Units of Measure: Millisiemens cm -1
*Precision of Measurements: 0.001
*Range or List of Values: 0-100
*Number Type: Real
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 9:
*Name: Dissolved_Oxygen
*Label: Water dissolved oxygen concentration
*Definition: Dissolved oxygen concentration of the water
*Measurement Scale: Ratio
*Units of Measure: mg/l
*Precision of Measurements: 0.01
*Range or List of Values: 0-15
*Number Type: Real
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 10:
*Name: pH
*Label: Water pH
*Definition: pH of the water
*Measurement Scale: Ratio
*Units of Measure: pH units
*Precision of Measurements: 0.01
*Range or List of Values: 0-14
*Number Type: Real
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 11:
*Name: Turbidity
*Label: Water turbidity
*Definition: Turbidity of the water
*Measurement Scale: Ratio
*Units of Measure: Nephelometric turbidity units
*Precision of Measurements: 0.01
*Range or List of Values: 0-50,000
*Number Type: Real
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 12:
*Name: Temperature_QA

*Label: Temperature quality assurance check
*Definition: This field is used to indicate whether the temperature data has passed a quality assurance review
*Measurement Scale: Nominal
*Units of Measure: NA
*Precision of Measurements: NA
*Range or List of Values: x = highly suspect data, s = suspect data, . = data passed quality assurance review
*Number Type: NA
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 13:
*Name: Specfic_Conductivity_QA
*Label: Conductivity quality assurance check
*Definition: This field is used to indicate whether the conductivity data has passed a quality assurance review
*Measurement Scale: Nominal
*Units of Measure: NA
*Precision of Measurements: NA
*Range or List of Values: x = highly suspect data, s = suspect data, . = data passed quality assurance review
*Number Type: NA
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 14:
*Name: Dissolved_Oxygen_QA
*Label: Dissolved oxygen quality assurance check
*Definition: This field is used to indicate whether the dissolved oxygen data has passed a quality assurance review
*Measurement Scale: Nominal
*Units of Measure: NA
*Precision of Measurements: NA
*Range or List of Values: x = highly suspect data, s = suspect data, . = data passed quality assurance review
*Number Type: NA
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 15:
*Name: pH_QA
*Label: pH quality assurance check
*Definition: This field is used to indicate whether the pH data has passed a quality assurance review
*Measurement Scale: Nominal
*Units of Measure: NA
*Precision of Measurements: NA
*Range or List of Values: x = highly suspect data, s = suspect data, . = data passed quality assurance review
*Number Type: NA
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

Variable 16:

*Name: Turbidity_QA
*Label: Turbidity quality assurance check
*Definition: This field is used to indicate whether the turbidity data has passed a quality assurance review
*Measurement Scale: Nominal
*Units of Measure: NA
*Precision of Measurements: NA
*Range or List of Values: x = highly suspect data, s = suspect data, . = data passed quality assurance review
*Number Type: NA
*Missing Data Code:
*Missing Data Code Explanation:
*Computational Method for Derived Data: NA

11] QA/QC Procedures: This data has been visually inspected to: 1) identify outliers and periods when the units
were buried by sediment or were not functioning properly, and 2) examine the data for consistency of individual
observations with temporal and spatial trends seen at upstream and downstream units.

12] Additional metadata:

13] Distribution: http://sev.lternet.edu/project_details.php?id=SEV190

15] LTER Project Information:

Title: Sevilleta Long Term Ecological Research (LTER) Project
Personnel:
GivenName: Scott
SurName: Collins
Delivery Address: Department of Biology, University of New Mexico
City: Albuquerque
State: NM
ZipCode: 87131
Email: scollins@sevilleta.unm.edu
Phone: (505) 277-6303
Role: Principal Investigator
Abstract: The overarching goal of the Sevilleta LTER is to understand how abiotic pulses and constraints affect dynamics and
stability in an arid landscape. Key landscape components of the Sevilleta LTER include desert grassland and shrubland, piñon-
juniper woodlands and the Middle Rio Grande riparian corridor.

Distribution: http://sev.lternet.edu

Funding: NSF grants BSR 88-11906, DEB 9411976,DEB 0080529 and DEB 0217774

ATTACHMENT B – Amigos Brazos Data Review

NEW MEXICO
ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau

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RON CURRY
Secretary
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Deputy Secretary

MEMORANDUM

TO: **James Hogan, SWQB Monitoring and Assessment Section Manager**

FROM: **Tim Michael, Interim QA Officer**

DATE: **December 14, 2009**

SUBJECT: **Sentinels-Rios de Taos Dataset**

Summary

From September 2007 through September 2008, Sentinels-Rios de Taos with the support of Amigos Bravos and Rivers and Birds collected ambient water quality data from surface water in the area around Taos New Mexico. The investigators collected samples at least once from 13 sites in the Rio Hondo (including a site labeled H4B), 6 sites in the Rio Pueblo de Taos and 5 sites in the Rio Fernando de Taos.

Details on the project, including a QAPP, are attached to this memo. The data submittal includes data for *E. coli*, total dissolved solids (TDS), nitrate, biological oxygen demand (BOD), temperature, pH, specific conductance and dissolved oxygen.

At your request, I have reviewed the documentation associated with the above listed parameters from the dataset to determine if the dataset meets SWQB QA/QC requirements. Specifically I addressed two issues: (1) is there documentation of QA/QC procedures that, at a minimum, meet the QA/QC requirements described in the SWQB's most recent QAPP; and (2) is there reasonable evidence and/or assurance that these procedures were followed.

My review indicates that most of the *E. coli* portion of this dataset does not meet SWQB QA/QC requirements and only data collected on 12/3/07 and 3/10/08 is acceptable for use with assessment. The remainder of the data is acceptable.

Basis

According to the SWQB Assessment Protocol (NMED/SWQB 2009a), “To be considered for development of the Integrated List, data must, at a minimum, meet the QA/QC requirements described in the SWQB’s most recent QAPP. Analytical methods used must meet the requirements specified in the analytical methods section of the QAPP and the methods of data collection must be the same as, or comparable to, those included in the State’s Standard Operating Procedures (SOPs) (NMED/SWQB 2007) referenced in the current QAPP. Additionally, the QC criteria used to verify and validate the data must be the same, or similar, to those listed in the SWQB Field Quality Control Sampling Summary and the SWQB Data Verification and Validation Procedures detailed in the QAPP.”

Current SWQB QAPP (NMED/SWQB 2009b) requirements are found in Section 2.0 Data Generation and Acquisition, in the appendices, and in the SOPs that are incorporated by reference.

The requirements are summarized below:

1. All data submitted should be accompanied by the QAPP under which it was collected.
2. Data must meet the QA/QC requirements of the SWQB QAPP.
3. Methods of analysis must match or be comparable with those identified in the QAPP
4. The sampling collection, preservation and holding times for the specified method must be met.

Requirement 1.

A QAPP was provided with the data submittal.

The QAPP provides information about sample collection locations, analysis types and the methods used. According to the QAPP, the samples were measured as indicated below:

	Analysis Type	Analytical Method or Equipment Used	Equipment	
			Range	Accuracy
E. coli	Laboratory	EPA 10029		
TDS	Laboratory	EPA 160.1		
Nitrate	Laboratory	EPA 300.0		
BOD	Laboratory	SM 5210B		
Temp	Field	Fisher Alcohol Thermometer, Model 15021B	-10 to 110°C	+/- 1°C
pH	Field	LaMotte Wide Range pH Test Kit Model P-5985 Code 2119	5.0 to 8.5 units	+/- 0.3 units
SC	Field	Oakton Conductivity ECTester Meter, Model 5-0082	0 to 1990 µS/cm	+/- 10 µS/cm
DO	Field	CHEMets Dissolved Oxygen Kit, Model K-7512	1 to 12 ppm	+/- 1 ppm

Requirement 2.

Sample analysis (other than field parameters) was performed at an EPA approved laboratory following EPA methods. Provided the data was collected following proper sampling, preservation and storage methods (requirement 4) the data is acceptable.

For the field parameters, a thermometer, a pH test kit, conductivity meter and a DO test kit were used. Provided the samples were carefully collected, the calibration solution for the conductivity meter properly controlled and its calibration documented, and the measurement were done in accordance with manufacturer's instructions, the data from this equipment is acceptable.

Requirement 3.

For *E. coli* the QAPP references EPA Method 10029. In reviewing 40CFR136.3, I find no reference to this method. EPA does appear to have a drinking water method 10029 (http://www.epa.gov/OGWDW/disinfection/lt2/pdfs/guide_lt2_mlmanual_appendix-o.pdf) which uses a m-ColiBlue24® broth for E. coli quantification – this is the same as a Hach Chemical test method 10029 (http://www.hach.com/hc/view.file.details.invoker/View=FIL1979/NewLinkLabel=MEMBRANE+FILTRATION+Method+10029). In reviewing the method it appears to correspond to EPA Method 1603 (modified m-TEC) which is a suitable method for ambient waters.

Nitrate was analyzed using EPA Method 300.0. SWQB's QAPP uses method 353.2. While a different method, the use of method 300.0 is appropriate for measurement of nitrate in surface water.

Requirement 4.

The preservation and holding time requirements of the methods are summarized below:

Parameter	Analytical Method	Preservation	Holding Time
E. coli	EPA 10029	None	8 hrs
TDS	EPA 160.1	None	7 days
Nitrate	EPA 300.0	None	48 hrs
BOD	SM 5210B	None	24 hrs

EPA Method 1603 in Section 8.1 says the following: "Examine samples as soon as possible after collection. Do not hold samples longer than 6 h between collection and initiation of analyses." and "Samples not collected according to these rules should not be analyzed." EPA Method 10029 in Section 8.3 says "Non-potable samples should be held at <10°C for a maximum period of 8 hours from sampling to analysis."

In reviewing the documentation, it is noted, "All laboratory samples were collected and processed with a 24-hr holding time limit." This holding time is inconsistent with the requirements of the method and therefore these data should not be used for assessment.

An exception is noted for "samples collected with NMED assistance (on 12/3/07 and 3/10/08) for E. coli analysis only were kept on ice for less than six hours before they were processed using the IDEXX bacteria enumeration system." These samples were collected following procedures consistent with the QAPP and as the data was collected with SWQB, there is a reasonable assurance that appropriate QA/QC procedures were followed for data collected on these days. Therefore, data collected on these days may be used.

As indicated above, the documentation states that the laboratory samples were properly chilled and processed within 24 hours. Therefore, with the exception of *E. coli*, the cooling and holding time requirements for TDS, nitrate and BOD were met.

References

NMED/SWQB 2007. *Standard Operating Procedures for Data Collection*. New Mexico Environment Department/Surface Water Quality Bureau, July 26, 2007.

NMED/SWQB 2009a. *Procedures for Assessing Water Quality Standards Attainment for the State of New Mexico CWA §303(d) /§305(b) Integrated Report: Assessment Protocol*. New Mexico Environment Department/Surface Water Quality Bureau, June 19, 2009.

NMED/SWQB 2009b. *Quality Assurance Project Plan for Water Quality Management Programs (QAPP)*. New Mexico Environment Department/Surface Water Quality Bureau, April 2009

2008 Taos Water Quality Sampling Report – Rio Hondo, Rio Fernando and Rio Pueblo de Taos

Lead: Sentinels-Rios de Taos
Support: Amigos Bravos and Rivers and Birds

Abstract: Surface water quality sampling was conducted in the Taos NM area between September 2007 and September 2008. Samples were collected at least once from 12 sites in the Rio Hondo, 6 sites in the Rio Pueblo de Taos, and 5 sites in the Rio Fernando de Taos. In September 2007, one site in the lower Rio Fernando and one site in the lower Rio Pueblo had conductivity readings above standards. In December 2007 one site in the Rio Pueblo had *E. coli* levels above the water quality standard.. In June 2008 one site in the Lower Rio Hondo had *E. coli* levels above the water quality standard. In June 2008 all 4 sites that were tested in the Rio Fernando had *E. coli* levels above water quality standards. In July 2008 two sites in the Rio Fernando and one site in the Rio Pueblo de Taos had *E. coli* levels above the water quality standard. All other samples met water quality standards for all tested constituents. Based on these results, where all three streams that were monitored had *E. coli* levels above the water quality standard for at least one sample event and in some cases multiple sample events during the one year sampling period, it is recommended that all streams be listed as impaired for *E. coli.*

Introduction: This sampling project was initiated by Sentinels – Rios de Taos due to a concern that inadequate data were available to accurately assess the health of the Rio Hondo, Rio Fernando, and Rio Pueblo de Taos watersheds. Sentinels- Rios de Taos contacted Amigos Bravos in 2005 with concerns about water quality in local watersheds. Specifically, there was some concern about nutrient loading in the upper Rio Hondo. With Amigos Bravos' assistance Sentinels-Rios de Taos identified sampling locations and developed a monitoring plan. Sentinels-Rios de Taos contacted Rivers and Birds in Arroyo Seco to invite them and the youth that they work with to participate in the project. National representatives from Sierra Club's Water Sentinels program traveled to Taos and gave several trainings to the Sentinels-Rios de Taos' volunteers. Sampling was initiated first in February of 2007 by Sentinels- Rios de Taos with assistance from Amigos Bravos and Rivers and Birds. This report covers the sampling that occurred between September 2007 and September 2008.

Methods: Surface water quality samples were collected from 12 sites in the Rio Hondo, 6 sites in the Rio Pueblo de Taos and 5 sites in the Rio Fernando de Taos (Appendix A and Appendix C). For all samples except for the 12/3/07 and 3/10/08 sampling events, samples were kept on ice until they were processed by Sangre de Cristo labs in Alamosa Colorado. On 12/3/07 and 3/10/08 Abraham Franklin with the New Mexico Environment Department (NMED) assisted in the collection of samples and took the samples back to the NMED lab and analyzed the samples for *E. coli* at the NMED facility.

Laboratory samples (those collected on all dates except 12/3/07 and 3/10/08) were collected for nitrates, biological oxygen demand, total dissolved solides, and *E. coli.* All

laboratory samples were collected and processed with a 24hr holding time limit. EPA approved methods and holding times were used to analyze the samples (Appendix B). Field measurements for pH, temperature, dissolved oxygen and conductivity were conducted (Appendix B).

Samples collected with NMED assistance (on 12/3/07 and 3/10/08) for *E. coli* analysis only were kept on ice for less than six hours before they were processed using the IDEXX bacteria enumeration system. The system uses a most probable number method to estimate numbers of *E. coli* per 100 mL of sample. The maximum estimate the system can provide (without dilution, when all but one well is positive) is 2419.6 colony forming units per 100 mL. When all wells are positive, the resulting estimate is greater than 2419.6 CFU/100mL, or too numerous to count.

Results:

Rio Hondo:

September 19, 2007: Six laboratory samples were collected in the Rio Hondo and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, conductivity, and dissolved oxygen were also taken. (Appendix C)

December 3, 2007: Nine samples were collected (one was a duplicate) in the Rio Hondo and analyzed for *E. coli* by the New Mexico Environment Department. Samples indicated the water quality standard for *E.coli* was being met at all locations. (Appendix C).

March 10. 2008: Five samples were collected in the Rio Hondo and analyzed for *E. coli* by the New Mexico Environment Department. Samples indicated the water quality standard for *E.coli* was being met at all locations. (Appendix C).

June 10, 2008: Eight laboratory samples were collected in the Rio Hondo and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, conductivity, and dissolved oxygen were also taken. At H5 (on the north bank about 20 yards upstream from bridge in Lower Arroyo Hondo, just before the road crosses the Rio Hondo and goes uphill towards New Buffalo) *E. coli* levels were above the water quality standard that is protective of swimming (Appendix C). No other tested parameters, either in the laboratory samples or field samples, were above water quality standards (Appendix C).

July 22, 2008: Four laboratory samples were collected in the Rio Hondo and analyzed for for *E. coli*, nitrate, BOD, and TDS. No water quality standard exceedences were recorded during this period (Appendix C).

September 15, 2008: Four laboratory samples were collected in the Rio Hondo and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. No water quality standard exceedences were recorded during this period (Appendix C).

Rio Pueblo:

September 19, 2007: Three laboratory samples were collected in the Rio Pueblo de Taos and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. The conductivity field reading taken at P3 (Rio Pueblo near the confluence with Rio Grande) showed conductivity levels of 430 microsiemens/cm which is above the applicable water quality standard of <=400. No other tested parameters, either in the laboratory samples or field samples, were above water quality standards (Appendix C).

December 3, 2007 - Six laboratory samples were collected (one was a duplicate) from the Rio Pueblo de Taos and analyzed for *E. coli* by the New Mexico Environment Department. At P2 (About 15 yards downstream from bridge at Ranchitos Road and Culebra Road. On the north side of stream by survey sign) *E. coli* was recorded at 435 cfu/100ml which is almost twice the water quality standard that is protective of swimming (235 cfu/100ml) (Appendix C).

March 10, 2008: Seven samples were collected (one was a duplicate) in the Rio Pueblo and analyzed for *E. coli* by the New Mexico Environment Department. Samples indicated the water quality standard for *E.coli* was being met at all locations (Appendix C).

June 10, 2008- Seven laboratory samples were collected from the Rio Pueblo de Taos and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. No water quality standard exceedences were recorded during this period (Appendix C).

July 22, 2008- Four laboratory samples were collected from the Rio Pueblo de Taos and analyzed for *E. coli*, nitrate, BOD, and TDS. At P2 (about 15 yards downstream from bridge at Ranchitos Road and Culebra Road, on the north side of stream by survey sign) *E. coli* was recorded at 260 cfu/100ml which is above the applicable the water quality standard that is protective of swimming (235 cfu/100ml) (Appendix C).

September 15, 2008 - Four laboratory samples were collected from the Rio Pueblo de Taos and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. No water quality standard exceedences were recorded during this period (Appendix C).

Rio Fernando:

September 19, 2007- Two laboratory samples were collected in the Rio Fernando and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. Dissolved oxygen (DO) levels at both sites sampled, F1 (near Divisidero Trail in Taos Canyon) and F4 (at Fred Baca Park), were not meeting standards. F1 had a DO level of 5.5ppm and F4 had a DO level of 3ppm. The applicable water quality standard for DO for these sites is >=6. The conductivity level at F4 (690

microsiemens/cm) also exceeded the applicable water quality standard of <=500 (Appendix C).

December 3, 2007: Three samples were collected in the Rio Fernando and analyzed for *E. coli* by the New Mexico Environment Department. Samples indicated the water quality standard for *E.coli* was being met at all locations (Appendix C).

March 10, 2008: Five samples were collected (one was a duplicate) in the Rio Fernando and analyzed for *E. coli* by the New Mexico Environment Department. Samples indicated the water quality standard for *E.coli* was being met at all locations (Appendix C).

June 10, 2008 – Four laboratory samples were collected in the Rio Fernando and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. All samples showed exceedences of the applicable *E. coli* standard that is protective of swimming. F1 (across the street from Divisidero Trailhead in Taos Canyon) had *E. coli* levels of 310 cfu/100ml, F1B (immediately downstream of shadybrook) had *E. coli* levels 269 cfu/100ml, F3 (about 25 yards down from Paseo del Pueblo Sur, near ABC Lock) had *E. coli* levels of 290 cfu/100ml and F4 (at Fred Baca Park) had *E.coli* levels of 288 cfu/100ml. The applicable water quality standard is 235 cfu/100ml.

July 22, 2008 – Three laboratory samples were collected in the Rio Fernando and analyzed for *E. coli*, nitrate, BOD, and TDS. Two samples showed considerable exceedences of the applicable *E. coli* standard that is protective of swimming. F1 (near Divisidero Trail in Taos Canyon) had *E. coli* levels of 596 cfu/100ml, and F4 (at Fred Baca Park) had *E.coli* levels of 610 cfu/100ml. The applicable water quality standard is 235 cfu/100ml.

September 15, 2008- Three laboratory samples were collected in the Rio Fernando and analyzed for *E. coli*, nitrate, BOD, and TDS. Field readings for temperature, pH, DO, and conductivity were also taken. No water quality standard exceedences were recorded during this period (Appendix C).

Discussion:

All three streams that were monitored had *E. coli* levels above the water quality standard for a single sample event at least once and in some cases multiple times during the one year sampling period. These results indicate that all streams should be listed on the state's 303d list as impaired for *E. coli.*

The levels and consistency of *E. coli* found in the Rio Fernando during the summer months (6 of the 7 samples taken during June and July exceeded the *E. coli* standard) are of concern. While there were only two sampling events during this period (one on June 10th and one on July 22nd), and sampling in the previous year during July does not show exceedences, the high levels in the summer 2008 are a cause for concern and may indicate an addition of new source of contamination.

It is interesting to note that in the Rio Pueblo de Taos and the Rio Hondo no water quality standards exceedences were observed at the sites in the upper parts of the watersheds. At no point during the five sampling events in the Rio Hondo were *E. coli* exceedences observed above Valdez. Also of note is the fact that when the Taos Ski Valley Discharge pipe was tested no *E. coli* was detected at all. A point on the Rio Fernando that was monitored (F1B- below the Shadybrook development) did show *E. coli* levels slightly above standards during the June sampling event.

In September 2007, one site in the lower Rio Fernando and one site in the lower Rio Pueblo had conductivity readings above standards. Also in September of 2007 both sites tested on the Rio Fernando (F1 and F4) showed low levels of dissolved oxygen (DO) that were not meeting the water quality standard. In both June 2008 and September 2008 the lower Rio Fernando site F4 (at Fred Baca Park) had conductivity readings that were well above standards. High conductivity readings seem to correspond to low flow times of the year. Another factor that may have contributed to the low DO level at the upstream location (F1) is the presence of a substantial amount of green algae growth in the river. Low DO levels can be harmful to fish and other aquatic life.

Conclusion:

- All three streams that were monitored had *E. coli* levels above the water quality standard for a single sample event at least once and in some cases multiple times during the one year sampling period. These results indicate that all streams should be listed on the state's 303d list as impaired for *E. coli.*
- Conductivity and DO levels in the Rio Fernando and conductivity levels in the lower Rio Pueblo are cause for concern and should be continued to be monitored.
- With the exception of the Rio Fernando, the water quality exceedences were detected in the lower segments of the watersheds, perhaps indicating a connection between increased human presence and water quality exceedences.
- Field data were not collected in July or August when water temperatures would be expected to be the highest, therefore we don't have a complete picture on how high water temperature went in the three streams studied.

APPENDIX A

SENTINELS-RIOS de TAOS WATER SAMPLING SITES

ON THE RIO FERNANDO

F1A	Above Shadybrook Development, about 5 miles east of Taos, by bridge on road to Valle Escondido
F1B	About 200 meters downstream from Shadybrook, by NF La Sombra campground.
F 1	About 10 yards downstream from the west bridge by the USFS parking lot at the Divisidero/South Boundarytrailhead. On the north bank.
F2	About 10 yards upstream from Paseo del Pueblo Sur, across street from ABC Lock. On the north bank. We'll usually use this site only when a storm is in progress.
F3	About 25 yards downstream for Paseo del Pueblo Sur, by ABC Lock. On the south bank, by a concrete bar.
F4	Fred Baca Park, about 50 yards downstream from the footbridge at the bend. On northwest side. of stream. N36 23' 56.8" W105 35' 23.2"

ON THE RIO PUEBLO

P 1	About 27 yards downstream from the stop sign on Upper Ranchitos Road at Paseo del Pueblo Norte. On north side of stream by the car wash. N36 25' 13" W105 34' 23"
P1A	N36 25' 08.4" W 105 34' 45.7"
P1B	Ranchitos Rd. Near bridge by Callegon Rd and SR 240 (near Hacienda de los Martinez). Mile Marker 4.
P1C	Ranchitos Rd near mile marker 13 go down dirt road to the left by road to Blackstone Ranch. N36 23' 34.6" W 105 37' 26.4"
P 2	About 15 yards downstream from bridge at Ranchitos Road and Culebra Road. On north side of stream by survey sign.

P 3	About 10 yards upstream from the road barrier from the parking lot on the northeast corner of Taos Junction Bridge area. On east bank of stream.

ON THE RIO HONDO

H 1	Above Phoenix Restaurant, which is upstream from the Bavarian Inn
H 2A	Rio Hondo just upstream from where the branch coming from Bavarian Inn (after going through the culvert under the trail) empties into the Rio Hondo.
H2B	Branch coming from Bavarian Inn just before it empties into the main Rio Hondo.
H 2C	About 10 yards upstream from the bridge near the day care center in the Ski Village. On the north bank.
H2C2	Directly above Taos Ski Valley Effluent Pipe
H2D	Just above the Riverside property, about 175 yards downstream from the stop sign at the intersection of the Village of TSV maintenance road and Route 150. North bank.
H2E	Rio Hondo directly downstream of effluent pipe N36 35’ 47” W105 27’ 43”
H2F	Taos Ski Valley effluent pipe
H 3	Cuchilla Campground, just downstream from entrance road. North bank.
H 4	Kaufman Property. About 20 yeards downstream from footbridge. South bank. N 36 32’ 14.8” W 105 38’ 43.4”
H4A	Just downstream from Route 522 Bridge, north bank. N 36 32’ 07.1” W 105 40’ 02.7”
H 5	About 20 yards upstream from bridge in Lower Arroyo Hondo, just before the road crosses the Rio Hondo and goes uphill towards New Buffalo. North bank. N 36 32’ 59.1” W 105 40’ 55.3
H 6	About 10 yards upstream from confluence with Rio Grande.
HVB	N 36 31’ 58.5” W 105 35’ 04.0”
HVG	5 M downstream from bridge on lane to Jackie Garcia property N 36 32’ 07.6” W 105 34’ 12.2”.

APPENDIX B

SENTINELS--RIOS de TAOS

QUALITY ASSURANCE PROJECT PLAN (QAPP)

Project Description

The goal of the Sentinels--Rios de Taos water monitoring project is to provide additional water quality data to local, state, and federal decision makers, as well as the public at large. This project was initiated due to a concern that inadequate data was available to accurately assess the health of the Rio Hondo, Rio Fernando, and Rio Pueblo de Taos watersheds. The cumulative impact of point and nonpoint sources of pollution will be characterized by collecting data on thoses parameters that are basic indicators of water quality and watershed health. Surface water samples collected by volunteer monitors will be analyzed for some or all of the following constituents:

- Nitrates
- Phosphorous
- Total Dissolved Solids
- E. Coli
- pH
- Conductivity
- Dissolved Oxygen
- Temperature
- Biological Oxygen Demand (BOD)

Sampling Locations

Sampling sites may change in attempt to identify sources of pollution. Some identified sampling sites include:

SENTINELS-RIOS de TAOS WATER SAMPLING SITES

ON THE RIO FERNANDO

F1A	Above Shadybrook Development, about 5 miles east of Taos, by bridge on road to Valle Escondido
F1B	About 200 meters downstream from Shadybrook, by NF La Sombra campground.

F 1	About 10 yards downstream from the west bridge by the USFS parking lot at the Divisidero/South Boundarytrailhead. On the north bank.
F2	About 10 yards upstream from Paseo del Pueblo Sur, across street from ABC Lock. On the north bank. We'll usually use this site only when a storm is in progress.
F3	About 25 yards downstream for Paseo del Pueblo Sur, by ABC Lock. On the south bank, by a concrete bar.
F4	Fred Baca Park, about 50 yards downstream from the footbridge at the bend. On northwest side. of stream. N36 23' 56.8" W105 35' 23.2"

ON THE RIO PUEBLO

P 1	About 27 yards downstream from the stop sign on Upper Ranchitos Road at Paseo del Pueblo Norte. On north side of stream by the car wash. N36 25' 13" W105 34' 23"
P1A	N36 25' 08.4" W 105 34' 45.7"
P1B	Ranchitos Rd. Near bridge by Callegon Rd and SR 240 (near Hacienda de los Martinez). Mile Marker 4.
P1C	Ranchitos Rd near mile marker 13 go down dirt road to the left by road to Blackstone Ranch. N36 23' 34.6" W 105 37' 26.4"
P 2	About 15 yards downstream from bridge at Ranchitos Road and Culebra Road. On north side of stream by survey sign.
P 3	About 10 yards upstream from the road barrier from the parking lot on the northeast corner of Taos Junction Bridge area. On east bank of stream.

ON THE RIO HONDO

H 1	Above Phoenix Restaurant, which is upstream from the Bavarian Inn
H 2A	Rio Hondo just upstream from where the branch coming from Bavarian Inn (after going through the culvert under the trail) empties into the Rio Hondo.
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H 2C	About 10 yards upstream from the bridge near the day care center in the Ski Village. On the north bank.
H2C2	Directly above Taos Ski Valley Effluent Pipe
H2D	Just above the Riverside property, about 175 yards downstream from the stop sign at the intersection of the Village of TSV maintenance road and Route 150. North bank.
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H 6	About 10 yards upstream from confluence with Rio Grande.
HVB	N 36 31’ 58.5” W 105 35’ 04.0”
HVG	5 M downstream from bridge on lane to Jackie Garcia property N 36 32’ 07.6” W 105 34’ 12.2”.

Testing results will be sent to Region 6 of the Environmental Protection Agency (EPA), the State of New Mexico Environmental Department's Surface Water Quality Bureau, Amigos Bravos, and local newspapers and publications. Sampling results will be stored in the Sierra Club Sentinels--Rios de Taos data base.

Project Organization

Project Coordinator Contact information:

Eric E. Patterson
Box 334
Valdez, NM 87580
505-776-2833
eepatt@gmail.com

The project coordinator ensures all components of the project identified by this QAPP are completed in an efficient and timely manner. This includes oversight on sample collection, delivery, analysis, and reporting.

Sample Collector Contact Information

Eric E. Patterson, contact person (see above)

Mary Pickett	Nora Patterson	Rachel Conn
Gary Grief	Dorothy Wells	
Annouk Ellis	Jeanne Green	
Roberta Salazar	Flowers Espinosa	

Sample collectors will conduct sample collection activities according to the methods identified by this QAPP. Responsibilities include:

- Calibration, maintenance and utilization of field equipment for analysis of dissolved oxygen (DO), temperature, pH, and conductivity.
- Obtaining needed sample containers and preservatives for sampling events.
- Following quality assurance procedures for sample collection identified by this QAPP.
- Filling out chain of custody (COC) forms.

Sample Transport Contact Information

Eric E. Patterson (see above)

Sample Transport will ensure that water samples are delivered to Sangre de Cristo Laboratory, Inc., Alamosa, CO, or another EPA certified laboratory, in a secure and timely manner. Responsibilities include:

- Keeping samples secure between sampling site and the laboratory.

- Maintaining COC document according to procedures identified.

- Delivering samples within specified holding times.

Sample Analysis/Laboratory Contact Information:

Sangre de Cristo Laboratory, Inc., an EPA certified laboratory
Tierra del Sol Industrial Park
2329 Lava Lane
Alamosa, CO 81101

Sample Analysis Staff will ensure that samples are analyzed in a manner that provides the most accurate data possible. Responsibilities include:

- Analyzing samples according the methods identified in Standard Operating Procedures(SOPs).

- Analyzing samples within established holding times.

- Reporting results to Project Coordinator

Data Reporting Contact Information

Rachel Conn, Amigos Bravos Clean Water Circuit Rider and Policy Analyst
Box 238
Taos, NM 87571
505-758-3874
rconn@amigosbravos.org

Data reporting will ensure the data collected by the project is stored appropriately and disseminated to interested parties. Responsibilities include:

- Organization of final report on data collected by the project.

- Dissemination of report to specified local, state and federal agencies.

- Dissemination of report to newspapers and other local news media and presentation of
- project information to the public upon request.

- Entering data into Sierra Club's Water Sentinel data base.

<u>Quality Assurance of Field Analysis</u>

Measurements will be made using the following equipment:

- CHEMets Dissolved Oxygen Kit, Model K-7512
- Fisher Alcohol Thermometer, Model 15021B
- Oakton Conductivity ECTester Meter, Model 5-0082
- LaMotte Wide Range pH Test Kit Model P-5985 Code 2119

PARAMETER	DETECTION LIMIT	ACCURACY
Dissolved Oxygen	1 to 12 mg/L	+/- 1 ppm
Temperature	-10° to 110° C	+/- 1° C
Conductivity	0 to 1990 µS/cm	+/-10 µS/cm
pH	5.0 to 8.5 ph units	+/-0.3 pH units

Field instruments will be calibrated according to manufacturers' instructions <24 hours prior to each sampling event. The conductivity meter will be calibrated using a known standard solution. Chemicals used for dissolved oxygen and pH analysis will be replaced according to expiration dates provided by the manufacturer. Samples will be collected using the containers, preservatives, volumes and holding times identified in Appendix A

Field Sample Collection Procedures

Samples will be collected:

- Midstream just below the water's surface.
- Facing upstream to avoid disturbances caused by the sample collector.
- Upstream of minor temporal or spatial impacts, such as bridges and campsites.
- Free of floating debris.
- Using appropriate sample containers and preservatives specified in Appendix A.

Samples will be tagged appropriately with identifying number/information and delivered to appropriate laboratory personnel accompanied by appropriately completed and signed Chain of Custody(COC) forms.

Quality Assurance of Laboratory Analysis

Quality assurance of laboratory methods is the sole responsibility of the sample analysis/laboratory coordinator previously identified. Samples will be analyzed using methods contained in the laboratory's Standard Operating Procedures. These are located at Sangre de Cristo Laboratory, Inc. and can be obtained from the sample analysis coordinator upon request.

METHODS FOR LABORATORY ANALYSIS

MATRIX	PARAMETER	METHOD
Nonpotable water	Total Dissolved Solids	EPA 160.1
Nonpotable water	Nitrates	EPA 300.0
Nonpotable water	Total Phosphorus	EPA 365.2
Nonpotable water	E. Coli	EPA 10029
Nonpotable water	BOD	SM 5210B