Annual Report Format

National Pollutant Discharge Elimination System Stormwater Program

MS4 Annual Report Format

Check box if you are submitting an individual Annual Report with one or more cooperative program elements. ☒

Check box if you are submitting an individual Annual Report with individual program elements only. ☐

Check box if this is a new name, address, etc. ☐

1. MS4(s) Information

UNIVERSITY OF NEW MEXICO

Name of MS4

Chemanji	Shu-Nyamboli	Environmental Health Manager
Name of Contact Person (First)	(Last)	(Title)

505-277-2766	cshu@unm.edu
Telephone (including area code)	E-mail

1801 Tucker Rd NE

Mailing Address

Albuquerque	NM	87131
City	State	ZIP code

What size population does your MS4(s) serve? 33,000 NPDES number

What is the reporting period for this report? (mm/dd/yyyy) From Jul 1, 2016 to Jun 30, 2017

2. Water Quality Priorities

A. Does your MS4(s) discharge to waters listed as impaired on a state 303(d) list? ☒ Yes ☐ No

B. If yes, identify each impaired water, the impairment, whether a TMDL has been approved by EPA for each, and whether the TMDL assigns a wasteload allocation to your MS4(s). Use a new line for each impairment, and attach additional pages as necessary.

Impaired Water	Impairment	Approved TMDL		TMDL assigns WLA to MS4	
AMAFCA (NDC) to Rio Grande	NM 2105_50	☒ Yes	☐ No	☒ Yes	☐ No
AMAFCA (SDC) to Rio Grande	NM 2105_50	☒ Yes	☐ No	☒ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No

2. B. Continued

Impaired Water	Impairment	Approved TMDL		TMDL assigns WLA to MS4	
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No

C. What specific sources contributing to the impairment(s) are you targeting in your stormwater program?

Trash, debris, sediment, pet waste (E. coli), hazardous chemicals, waste from birds (E. coli), fats, oils, nutrients

D. Do you discharge to any high-quality waters (e.g., Tier 2, Tier 3, outstanding natural resource waters, or other state or federal designation)? ☐ Yes ☒ No

E. Are you implementing additional specific provisions to ensure their continued integrity? ☐ Yes ☒ No

3. Public Education and Public Participation

A. Is your public education program targeting specific pollutants and sources of those pollutants? ☒ Yes ☐ No

B. If yes, what are the specific sources and/or pollutants addressed by your public education program?

Trash, debris, E. coli (from pet waste), sediment, chemicals (motor oil, fertilizer).

C. Note specific successful outcome(s) (e.g., quantified reduction in fertilizer use; NOT tasks, events, publications) fully or partially attributable to your public education program during this reporting period.

UNM's 14 radio ads on KUNM, 10 during drive time slots and 4 during Run of Schedule, from April 18, 2017 through May 1, 2017, focussed on cleaning up after pets, and reached thousands in Albuquerque Area.

D. Do you have an advisory committee or other body comprised of the public and other stakeholders that provides regular input on your stormwater program? ☐ Yes ☒ No

4. Construction

A. Do you have an ordinance or other regulatory mechanism stipulating:

Erosion and sediment control requirements? ☒ Yes ☐ No

Other construction waste control requirements? ☒ Yes ☐ No

Requirement to submit construction plans for review? ☒ Yes ☐ No

MS4 enforcement authority? ☒ Yes ☐ No

B. Do you have written procedures for:

Reviewing construction plans? ☒ Yes ☐ No

Performing inspections? ☒ Yes ☐ No

Responding to violations? ☒ Yes ☐ No

C. Identify the number of active construction sites ≥ 1 acre in operation in your jurisdiction at any time during the reporting period. 1

D. How many of the sites identified in 4.C did you inspect during this reporting period? 1

E. Describe, on average, the frequency with which your program conducts construction site inspections.

On average, UNM personnel inspect construction sites once a month during active construction, and within 24 hours after a storm event. Qualified contractors inspect the sites at frequencies required in the Construction General Permit.

F. Do you prioritize certain construction sites for more frequent inspections? ☒ Yes ☐ No

If Yes, based on what criteria? Sites under active construction during monsoon season

G. Identify which of the following types of enforcement actions you used during the reporting period for construction activities, indicate the number of actions, or note those for which you do not have authority:

☐ Yes	Notice of violation		No Authority	☒
☐ Yes	Administrative fines		No Authority	☒
☒ Yes	Stop Work Orders		No Authority	☐
☐ Yes	Civil penalties		No Authority	☒
☐ Yes	Criminal actions		No Authority	☒
☐ Yes	Administrative orders		No Authority	☒
☒ Yes	Other	Contractual Mechanisms to		

H. Do you use an electronic tool (e.g., GIS, data base, spreadsheet) to track the locations, inspection results, and enforcement actions of active construction sites in your jurisdiction? ☐ Yes ☒ No

I. What are the 3 most common types of violations documented during this reporting period?

Tracking sediment and debris onto the street.

J. How often do municipal employees receive training on the construction program? As needed

5. Illicit Discharge Elimination

A. Have you completed a map of all outfalls and receiving waters of your storm sewer system? ☐ Yes ☒ No

B. Have you completed a map of all storm drain pipes and other conveyances in the storm sewer system? ☒ Yes ☐ No

C. Identify the number of outfalls in your storm sewer system. UNM's sewer has none

D. Do you have documented procedures, including frequency, for screening outfalls? ☐ Yes ☒ No

E. Of the outfalls identified in 5.C, how many were screened for dry weather discharges during this reporting period?

None

F. Of the outfalls identified in 5.C, how many have been screened for dry weather discharges at any time since you obtained MS4 permit coverage? None

G. What is your frequency for screening outfalls for illicit discharges? Describe any variation based on size/type.

UNM does not have what would be considered outfalls as defined in Part VII of the permit. UNM has identified discharge points into major drainage channels within the MS4, and monitors those according to the schedule in the SWMPP.

H. Do you have an ordinance or other regulatory mechanism that effectively prohibits illicit discharges? ☒ Yes ☐ No

I. Do you have an ordinance or other regulatory mechanism that provides authority for you to take enforcement action and/or recover costs for addressing illicit discharges? ☒ Yes ☐ No

J. During this reporting period, how many illicit discharges/illegal connections have you discovered? 0

K. Of those illicit discharges/illegal connections that have been discovered or reported, how many have been eliminated? 0

L. How often do municipal employees receive training on the illicit discharge program? As needed

6. Stormwater Management for Municipal Operations

A. Have stormwater pollution prevention plans (or an equivalent plan) been developed for:

All public parks, ball fields, other recreational facilities and other open spaces	☒ Yes	☐ No
All municipal construction activities, including those disturbing less than 1 acre	☒ Yes	☐ No
All municipal turf grass/landscape management activities	☒ Yes	☐ No
All municipal vehicle fueling, operation and maintenance activities	☒ Yes	☐ No
All municipal maintenance yards	☒ Yes	☐ No
All municipal waste handling and disposal areas	☒ Yes	☐ No

Other

B. Are stormwater inspections conducted at these facilities? ☐ Yes ☒ No

C. If Yes, at what frequency are inspections conducted?

D. List activities for which operating procedures or management practices specific to stormwater management have been developed (e.g., road repairs, catch basin cleaning).

Management practices are in place for street sweeping and trash pickup.

E. Do you prioritize certain municipal activities and/or facilities for more frequent inspection? ☐ Yes ☒ No

F. If Yes, which activities and/or facilities receive most frequent inspections?

G. Do all municipal employees and contractors overseeing planning and implementation of stormwater-related activities receive comprehensive training on stormwater management? ☒ Yes ☐ No

H. If yes, do you also provide regular updates and refreshers? ☒ Yes ☐ No

I. If so, how frequently and/or under what circumstances?

UNM Grounds and Landscaping staff receive training on stormwater management. UNM contractors are required obtain and maintain training and certification in stormwater management.

7. Long-term (Post-Construction) Stormwater Measures

A. Do you have an ordinance or other regulatory mechanism to require:

Site plan reviews for stormwater/water quality of all new and re-development projects?	☒ Yes	☐ No
Long-term operation and maintenance of stormwater management controls?	☒ Yes	☐ No
Retrofitting to incorporate long-term stormwater management controls?	☐ Yes	☒ No

B. If you have retrofit requirements, what are the circumstances/criteria?

There are no retrofit requirements. However, UNM is replacing the grates on stormwater inlets with smaller sized grates. UNM has replaced about 25 grates.

C What are your criteria for determining which new/re-development stormwater plans you will review (e.g., all projects, projects disturbing greater than one acre, etc.)?

All UNM projects are reviewed.

D. Do you require water quality or quantity design standards or performance standards, either directly or by reference to a state or other standard, be met for new development and re-development? ☒ Yes ☐ No

E. Do these performance or design standards require that pre-development hydrology be met for:

Flow volumes	☒ Yes	☐ No
Peak discharge rates	☒ Yes	☐ No
Discharge frequency	☐ Yes	☒ No
Flow duration	☐ Yes	☒ No

F. Please provide the URL/reference where all post-construction stormwater management standards can be found.

https://srs.unm.edu/construction-safety/media/docs/srs-contractor-requirements.pdf

G. How many development and redevelopment project plans were reviewed during the reporting period to assess impacts to water quality and receiving stream protection? 0

H. How many of the plans identified in 7.G were approved? 0

I. How many privately owned permanent stormwater management practices/facilities were inspected during the reporting period? 0

J. How many of the practices/facilities identified in I were found to have inadequate maintenance? 0

K. How long do you give operators to remedy any operation and maintenance deficiencies identified during inspections? NA

L. Do you have authority to take enforcement action for failure to properly operate and maintain stormwater practices/facilities? ☐ Yes ☒ No

M. How many formal enforcement actions (i.e., more than a verbal or written warning) were taken for failure to adequately operate and/or maintain stormwater management practices? 0

N. Do you use an electronic tool (e.g., GIS, database, spreadsheet) to track post-construction BMPs, inspections and maintenance? ☐ Yes ☒ No

O. Do all municipal departments and/or staff (as relevant) have access to this tracking system? ☐ Yes ☒ No

P. How often do municipal employees receive training on the post-construction program? As needed

8. Program Resources

A. What was the annual expenditure to implement MS4 permit requirements this reporting period? $344,664.88

B. What is next year's budget for implementing the requirements of your MS4 NPDES permit? ~$400,000

C. This year what is/are your source(s) of funding for the stormwater program, and annual revenue (amount or percentage) derived from each?

Source:	Institutional and Government funds	Amount $		OR %	100
Source:		Amount $		OR %	
Source:		Amount $		OR %	

D. How many FTEs does your municipality devote to the stormwater program (specifically for implementing the stormwater program; not municipal employees with other primary responsibilities)? 1 FTE

E. Do you share program implementation responsibilities with any other entities? ☒ Yes ☐ No

Entity	Activity/Task/Responsibility	Your Oversight/Accountability Mechanism
Cooperative	Stormwater compliance monitoring	Intergovernmental Agreement

9. Evaluating/Measuring Progress

A. What indicators do you use to evaluate the overall effectiveness of your stormwater management program, how long have you been tracking them, and at what frequency? These are not measurable goals for individual management practices or tasks, but large-scale or long-term metrics for the overall program, such as macroinvertebrate community indices, measures of effective impervious cover in the watershed, indicators of in-stream hydrologic stability, etc.

Indicator	Began Tracking (year)	Frequency	Number of Locations
Example: E. coli	2003	Weekly April–September	20
E. coli	2016	Schedule defined in monitorin	2

B. What environmental quality trends have you documented over the duration of your stormwater program? Reports or summaries can be attached electronically, or provide the URL to where they may be found on the Web.

Given the data collected (1 year, 4 samples) by the Compliance Monitoring Cooperative (CMC), observable trends have not yet been identified. CMC monitoring memos are included as attachments to this Annual Report.

10. Additional Information

Please attach any additional information on the performance of your MS4 program, including information required in Parts I.C, I.D, and III.B. If providing clarification to any of the questions above, please provide the question number (e.g., 2C) in your response.

Certification Statement and Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

☒ Yes ☐ No

Federal regulations require this application to be signed as follows: **For a municipal, State, Federal, or other public facility**: by either a principal executive or ranking elected official.

Signature [signature] Univ. Controller | David W. Harris, EVP Administration | 11/21/2017

Name of Certifying Official, Title | Date (mm/dd/yyyy)

Bohannan Huston

Engineering
Spatial Data
Advanced Technologies

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

MEMORANDUM

DATE: March 6, 2017

TO: Jerry Lovato, PE, AMAFCA
Patrick Chavez, PE, AMAFCA

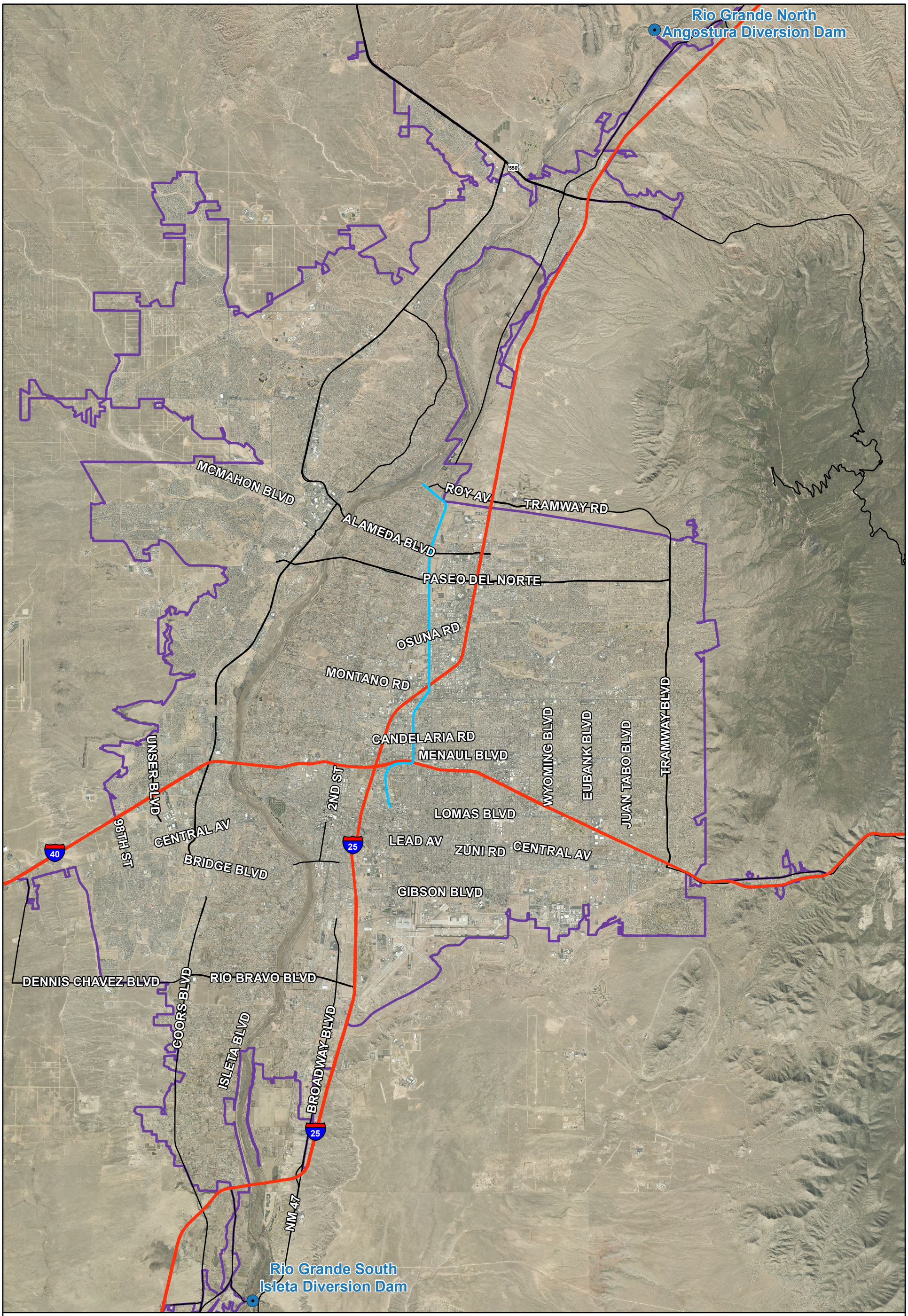
FROM: Craig Hoover, PE
Sarah Ganley, PE SJG
Angie Bacigalupa, EI AMB

SUBJECT: **CMC Wet Season, Wet Weather Stormwater Monitoring Data Verification, Analysis Results Database, and Reporting FY 2017 Wet Season (July 1 to October 31, 2016) Memo**

Overview of Stormwater Monitoring Activity

Bohannan Huston, Inc. (BHI) has been tasked to perform water quality services for the Compliance Monitoring Cooperative (CMC) Stormwater Data Verification, Database, and Reporting for the Wet Weather Stormwater Quality Monitoring Program for Fiscal Year (FY) 2017 (July 1, 2016 to June 30, 2017). The scope of work for this task includes data verification of the stormwater laboratory analysis results, compiling the analysis results into a database, and calculating the E. coli daily loading to compare with the Waste Load Allocation (WLA) for the qualifying storm events. The stormwater compliance monitoring is being conducted separately by Daniel B. Stephens & Associates, Inc. (DBS&A) and is not a part of this on-call task. This task is being conducted to assist the CMC members with their comprehensive monitoring and assessment program for compliance under the 2014 Middle Rio Grande Watershed Based Municipal Separate Storm Sewer System (MS4) Permit, NPDES Permit No. NMR04A000 ("WSB MS4 Permit").

As identified in the CMC Monitoring Plan, the WSB MS4 Permit requires that a minimum of seven (7) storm events be sampled at both the Rio Grande North and Rio Grande South locations (refer to Figure 1, page 2). During the 5-year WSB MS4 Permit term, at least three (3) events must be sampled in the wet season (between July 1 and October 31, 2016) and at least two (2) events in the dry season (between November and June). The remaining two (2) required events can be obtained during either the wet or dry seasons. During the FY 2017 wet season (July to October 2016) there were three (3) qualifying storm events where samples were collected for both the Rio Grande North and Rio Grande South locations.



AMAFCA

Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- CMC Monitoring Locations
- North Diversion Channel
- Albuquerque Urbanized Area
- Interstate Highway
- U.S. Highway
- State Highway

N W E S

0 0.5 1 2
Miles

CMC Monitoring Locations

Figure 1

P:\20170386\WR\Reports\Preliminary & Draft\Figures\MXDs\Figure1-CMCMonitoringLocations.mxd
Author: gmaynard

January 2017

Summary of the CMC Sampling Plan

Sampling Parameters:

Samples from both the Rio Grande North and Rio Grande South monitoring locations were analyzed for the parameters defined in the EPA approved WSB MS4 CMC Monitoring Plan, May 5, 2016. The parameter list for both the locations, which is intended to characterize stormwater discharges into the river, is as follows:

Total Suspended Solids (TSS)
Total Dissolved Solids (TDS)
Chemical Oxygen Demand (COD)
Biological Oxygen Demand – 5-day (BOD_5)
Dissolved Oxygen (DO)
Oil & grease (N-Hexane Extractable Material)
E. coli
pH
Total Kjeldahl Nitrogen (TKN)
Nitrate plus Nitrite
Dissolved Phosphorus
Ammonia plus Organic Nitrogen (Nitrogen, Ammonia and Nitrogen, Total)
Phosphorous (Total Phosphorous)
Polychlorinated Biphenyls (PCBs - Method 1668A)
Gross Alpha
Tetrahydrofuran
Benzo(a)pyrene
Benzo(b)fluoranthene (3, 4 Benzofluoranthene)
Benzo(k)fluoranthene
Chrysene
lndeno(1 ,2,3-cd)pyrene
Dieldrin
Pentachlorophenol
Benzidine
Benzo(a)anthracene
Dibenzofuran
Dibenzo(a, h)anthracene
Chromium VI (Hexavalent)
Copper- Dissolved
Lead- Dissolved
Bis(2-ethylhexyl)phthalate
Conductivity
Temperature
Hardness (as CaCO3) – added to allow dissolved metal results to be compared to the applicable water quality standards

DO, pH, conductivity, and temperature are required by the WSB MS4 Permit to be analyzed in the field during sample collection, which was conducted by DBS&A, within fifteen (15) minutes of sample collection. All E. coli samples were submitted to the laboratory within six (6) hours of collection in order to meet the specified hold time.

Sampling Locations:

The sampling locations are shown in Figure 1, page 2.

Rio Grande North – Instream sampling within the Rio Grande was performed upstream of the Angostura Diversion Dam at the north end of the watershed. The location is upstream of all inputs from the Urban Area (UA) to the river and provides the background water conditions.

Rio Grande South – Instream sampling within the Rio Grande was performed at the Isleta Bridge at the south end of the watershed. The location is downstream of all inputs from the UA to the river and provides the downstream water conditions.

These locations have been accepted by EPA and New Mexico Environment Department (NMED) to meet the WSB MS4 Permit requirements in Part III.A. These North and South instream sample locations capture all inputs to the Rio Grande within the UA.

Sample Collection:

As mentioned previously, sample collection for the CMC is being conducted by DBS&A through a separate on-call contract. Since BHI was not involved, this task and memo do not address the details of the methodologies regarding sampling, determining if an event was a qualifying storm event, or determining the timing of the hydrograph at the Rio Grande South location.

DBS&A provided BHI with their field notes and field sample data (temperature, DO, specific conductivity, and pH) for the FY 2017 wet season sampling. AMAFCA provided BHI the completed laboratory analysis reports from Hall Environmental Analysis Laboratory (HEAL) for this monitoring season.

Quality Assurance Project Plan (QAPP):

AMAFCA provided BHI with the Draft Quality Assurance Project Plan (QAPP) for the CMC dated June 14, 2016. DBS&A followed this QAPP during sample collection. BHI used this QAPP and the included standard operating procedures (SOPs) for the data verification and validation.

Monitoring Activity & Lab Analysis Summary

The list below provides a chronological summary of the CMC comprehensive monitoring program activities completed by DBS&A for the FY 2017 wet season from July 2016 through October 2016. Three (3) qualifying storm events were sampled and analyzed during the FY 2017 wet season. In addition, there were four (4) other precipitation events during this wet season that did not evolve into qualifying storm events; however, an E. coli sample was still collected and field data was measured for the Rio Grande North location.

- **August 2 – Only E. coli for Rio Grande North.** A sample was collected at the Rio Grande North location and sent to the laboratory for an E. coli only test. Based on review of the storm event by the CMC, it was determined this was not a qualifying storm event; therefore, full parameter testing did not occur for the sample collected at the Rio Grande North location.
- **August 3 – Only E. coli for Rio Grande North.** A sample was collected at the Rio Grande North location and sent to the laboratory for an E. coli only test. Based on review

of the storm event by the CMC, it was determined this was not a qualifying storm event; therefore, full parameter testing did not occur for the sample collected at the Rio Grande North location.

- **August 10-11 – Qualifying Storm Event – Full Analysis of Samples**. A sample was collected at the Rio Grande North location beginning at noon on August 10 and sent to the laboratory for an E. coli only test. The CMC determined that the storm event beginning August 10 was a qualifying storm event. A Rio Grande South sample was collected beginning at 10:30 a.m. on August 11; the samples from the North (from August 10 collection) and South locations were taken to the laboratory for full parameter testing.

  Due to miscommunication with the laboratory, analysis for PCBs for the August 10-11 samples were conducted using EPA Method 608. The results from this qualifying event do not have EPA Method 1668 results for PCBs. A footnote in Appendix F of the WSB MS4 Permit states that "EPA Method 1668 should be utilized when PCB water column monitoring is conducted to determine compliance with Permit requirements."
- **August 31 – Only E. coli for Rio Grande North.** A sample was collected at the Rio Grande North location and sent to the laboratory for an E. coli only test. Based on review of the storm event by the CMC, it was determined this was not a qualifying storm event; therefore, full parameter testing did not occur for the sample collected at the Rio Grande North location.
- **September 7 – Only E. coli for Rio Grande North.** A sample was collected at the Rio Grande North location and sent to the laboratory for an E. coli only test. Based on review of the storm event by the CMC, it was determined this was not a qualifying storm event; therefore, full parameter testing did not occur for the sample collected at the Rio Grande North location
- **September 12-13 – Qualifying Storm Event – Full Analysis of Samples**. A sample was collected at the Rio Grande North location beginning at 11:00 a.m. on September 12 and sent to the laboratory for an E. coli only test. The CMC determined that the storm event beginning September 12 was a qualifying storm event. A Rio Grande South sample was collected beginning at 7:15 a.m. on September 13; the samples from the North (from September 12 collection) and South locations were taken to the laboratory for full parameter testing. Analysis for PCBs for the September 12-13 samples were conducted using both EPA Method 608 and Method 1668.
- **September 21-22 – Qualifying Storm Event – Full Analysis of Samples**. A sample was collected at the Rio Grande North location beginning at 12:15 p.m. on September 21 and sent to the laboratory for an E. coli only test. The CMC determined that the storm event beginning September 21 was a qualifying storm event. A Rio Grande South sample was collected beginning at 11:00 a.m. on September 22; the samples from the North (from September 21 collection) and South locations were taken to the laboratory for full parameter testing. Analysis for PCBs for the September 21-22 samples were conducted using both EPA Method 608 and Method 1668.

Stormwater Quality Database for CMC

As stated previously, there were three (3) qualifying storm events during the FY 2017 wet season, wet weather monitoring which occurred August 10-11, September 12-13, and September 21-22. DBS&A's field notes containing DO, pH, conductivity, and temperature measurements, as well as comments for the sampling done in August and September have been received, and field results

have been added to the database. Additionally, the HEAL reports for the corresponding time period have been received, added to the database, and are provided with this memo (Attachment 1). The laboratory reports attached to this memo have BHI added comments including the field parameter measurements and other relevant notes related to the laboratory report.

The HEAL analyses for these three (3) qualifying storm events contain the full parameter list for both the Rio Grande North and Rio Grande South sampling locations. There were several other precipitation events that did not evolve into qualifying storm events; however, an E. coli sample was still collected and field data was measured for the Rio Grande North location. These HEAL lab reports are also provided with this memo (Attachment 1). Despite not being qualifying storm events, the field and E. coli data collected were added to the database as they provide additional background data for the CMC program.

Database Creation and Data Entry:

An Excel database of the FY 2017 wet season, wet weather monitoring data was created for this Task. The database contains sample locations (Rio Grande North and Rio Grande South), sample date, analyses conducted, methods used, applicable surface water quality standards (WQS), WSB MS4 Permit required Minimum Quantification Levels (MQL), and analysis results. Applicable surface WQS found in New Mexico Administrative Code (NMAC) 20.6.4 as well as the Pueblo of Isleta and Pueblo of Sandia WQS are entered in the Excel database for comparison purposes with testing results. There is an indicator in the database to show if the monitoring results exceed the applicable surface WQS. An exceedance is not a violation of the WSB MS4 Permit, as the Permit does not have numeric discharge limitations. These ">WQ Standard" flags simply and quickly show the CMC members where the results of the lab data exceed the applicable WQS.

Upon receipt of the HEAL lab reports, water quality data was entered in to the database. All data entered in to the database is initially denoted with a "P" to indicate that it is provisional and has not been through the verification and validation process yet. Full parameter analyses of qualifying storm events for both Rio Grande North and Rio Grande South locations were entered respectively into the database. In addition, the E. coli and field data only samples from the Rio Grande North location, obtained during non-qualifying storm events, were also entered into the database. The database also contains Rio Grande monitoring results from two prior storm events occurring on July 15, 2014, and September 22, 2015, which were obtained during previous BHI/DBS&A tasks with AMAFCA. These were included in the database for comparison purposes, and they may assist the CMC with future analyses.

Data Verification and Validation:

The HEAL laboratory analysis reports were provided to BHI by AMAFCA. The lab reports also contain the Chain of Custody for the submitted samples. Field data was requested by and provided to BHI by DBS&A. Data verification and validation (V&V) was conducted by BHI on all field notes, lab reports, and Chain of Custody documents in accordance with the CMC Water Quality Standard Operating Procedure (SOP) #2, which is part of the existing CMC QAPP, Draft June 14, 2016. These procedures are based on EPA Guidance for Environmental Data Verification and Validation (U.S. EPA, 2008).

As stated in the QAPP, the V&V process was completed by a different person than the one who entered the data into the database. The V & V process included use of the *Data Verification and Validation Worksheet* (provided in the QAPP). For this task, field data was verified first, confirming that all field notes were complete. BHI handled field parameter questions directly with DBS&A. Chemical data verification began as soon as the lab reports were received, checking that all parameters were tested and looking for any obvious exceedances of WQS. Other steps listed on the *Data Verification and Validation Worksheet* were completed after all data from the laboratory was received and entered into the database. Sample blank results were reviewed to identify potential contamination during field processing or transport. Replica/duplicate samples were evaluated based on relative percent difference (as described in more detail in the QAPP) to determine the variability of the samples.

As the CMC members are aware, the August 10-11, 2016, sample was tested for PCBs using EPA Method 608 only. The other two qualifying storm event samples used both EPA Method 608 and Method 1668 for PCB testing.

In addition, in January 2017 the CMC members were made aware that the E. coli units reported in colony forming units (CFU)/100 milliliters (mL) in the HEAL reports should have been reported as most probable number (MPN) per 100 mL. The laboratory method used by HEAL is an EPA approved method that produces results in MPN/100 mL. After review and discussion with NMED, the units MPN/100 mL and CFU/100 mL are considered to be interchangeable for the purposes of this stormwater quality monitoring reporting. The New Mexico and Pueblo WQS for E. coli are currently in units of CFU/100 mL. Documentation related to the E. coli units is provided in Attachment 3 of this memo.

There were not any CMC FY 2017 wet season data that did not meet the appropriate QA/QC requirements. If there were any data that did not meet the appropriate QA/QC requirements, it would have been assigned an appropriate laboratory qualifier or validation codes. A summary of validation codes is provided in the QAPP.

Once the V&V process was completed, the worksheets were signed. Copies of the V&V worksheets are provided with this memo (Attachment 2). In the database, data that was checked during the V&V process was then changed from being denoted with a “P” for provisional to a “V” for verified, and laboratory qualifiers were added, as needed.

CMC FY 2017 Wet Season Assessment and Evaluation of Monitoring Results

The EPA approved WSB MS4 CMC Monitoring Plan, May 5, 2016, has thirty-four (34) parameters to monitor at the Rio Grande North and Rio Grande South monitoring locations. Of these thirty-four (34) parameters, over half of the parameters—eighteen (18) parameters—were not detected in any of the FY 2017 wet season samples at either the Rio Grande North or South locations. Refer to Table 1 for a list of the parameters that were not detected.

Table 1: Parameters Not Detected
CMC FY 2017 Wet Season Monitoring

Parameters Not Detected	
Oil and Grease (N-Hexane Extractable Material)	Dieldren
Total Kjedahl Nitrogen (TKN)	Pentachlorophenol
Ammonia (mg/L as N)	Benzidine
Tetrahydrofuran	Benzo(a)anthracene
Benzo(a)pyrene	Dibenzofuran
Benzo(b)fluoranthene (3, 4 Benzofluoranthene)	Dibenzo(a,h)anthracene
Benzo(k)fluoranthene	Chromium VI (Hexavalent)
Chrysene	Dissolved Lead
Indeno(1,2,3-cd)Pyrene	Bis (2-ethyhexyl) Phthalate

E. coli:

For the remaining sixteen (16) parameters on the CMC monitoring parameter list, only one parameter (E. coli) had exceedances of the applicable surface WQS found in New Mexico Administrative Code (NMAC) 20.6.4 and the Pueblo of Isleta and Pueblo of Sandia WQS during the FY 2017 wet season. At the Rio Grande North location (upstream of the Albuquerque UA, at the Angostura Diversion Dam), seven (7) samples were collected and tested for E. coli, and two (2) of the samples had results that exceeded the primary contact-single sample Pueblo of Isleta and Pueblo of Sandia WQS (88 CFU/100 mL). At the Rio Grande South location (downstream of the MS4 UA), three (3) samples were collected and tested for E. coli, and all of these samples had results that exceeded the primary contact-single sample NMAC WQS (410 CFU/100 ml) as well as the Pueblo of Isleta and Pueblo of Sandia WQS (88 CFU/100 mL). As a reminder, the E. coli units of MPN/100 mL and CFU/100 mL are considered to be interchangeable. The graphs presented in this section use units of CFU/100 mL to be consistent with the WQSs units. Refer to Figure 2 for a graphical representation of Wet Season E. coli results.

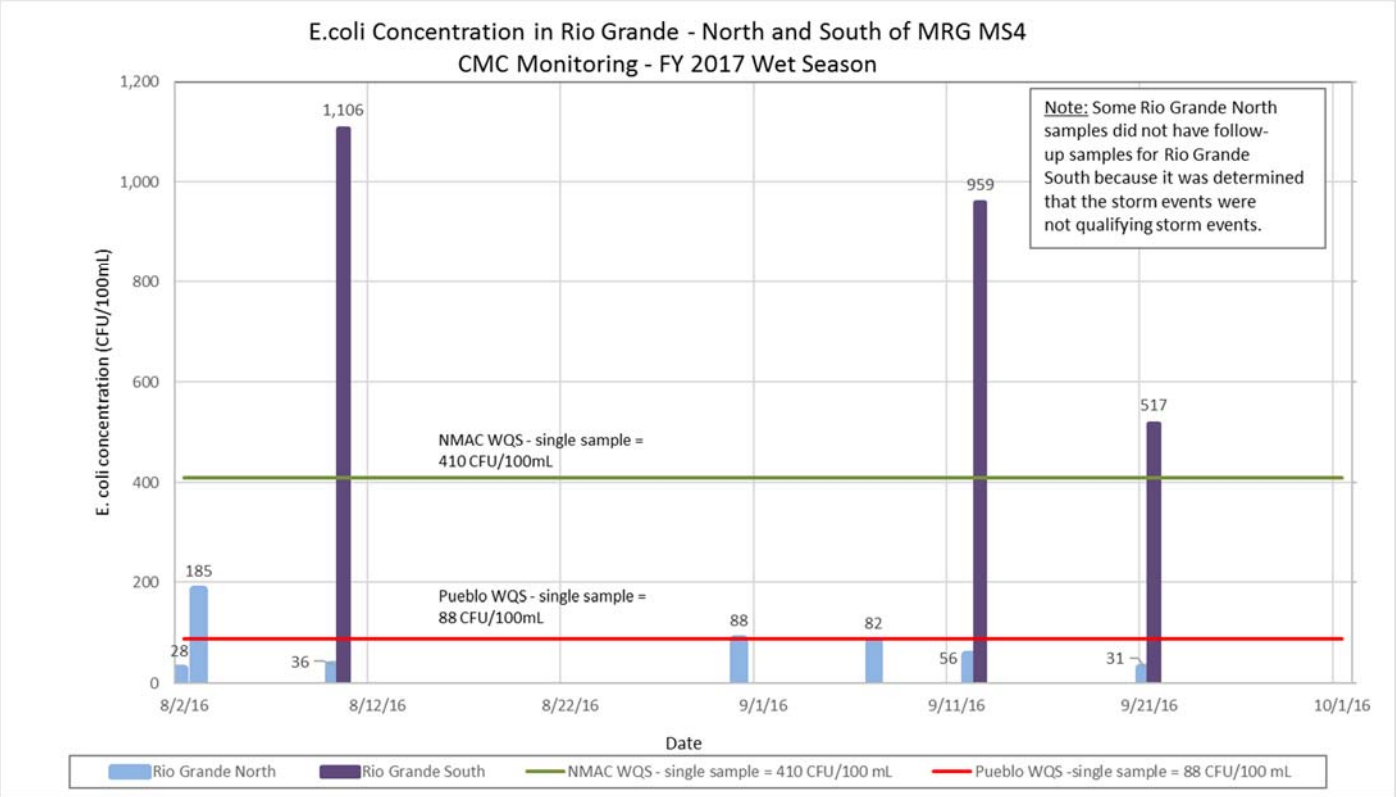


Figure 2: E. coli Results
CMC Monitoring – FY 2017 Wet Season

No E. coli samples in the Rio Grande under this monitoring program were obtained in July 2016 or October 2016. In August 2016, multiple samples were obtained for the Rio Grande North location and one (1) sample for the Rio Grande South location. In September 2016, multiple samples were obtained for the Rio Grande North and South locations. A geometric mean of the collected data was calculated for each month (August and September 2016), and these were compared to the E. coli monthly geometric mean WQS (NMAC monthly geometric mean = 126 CFU/100 mL and Pueblo monthly geometric mean = 47 CFU/100 mL). Refer to Figures 3 and 4 for the geometric mean results and comparison to applicable WQS.

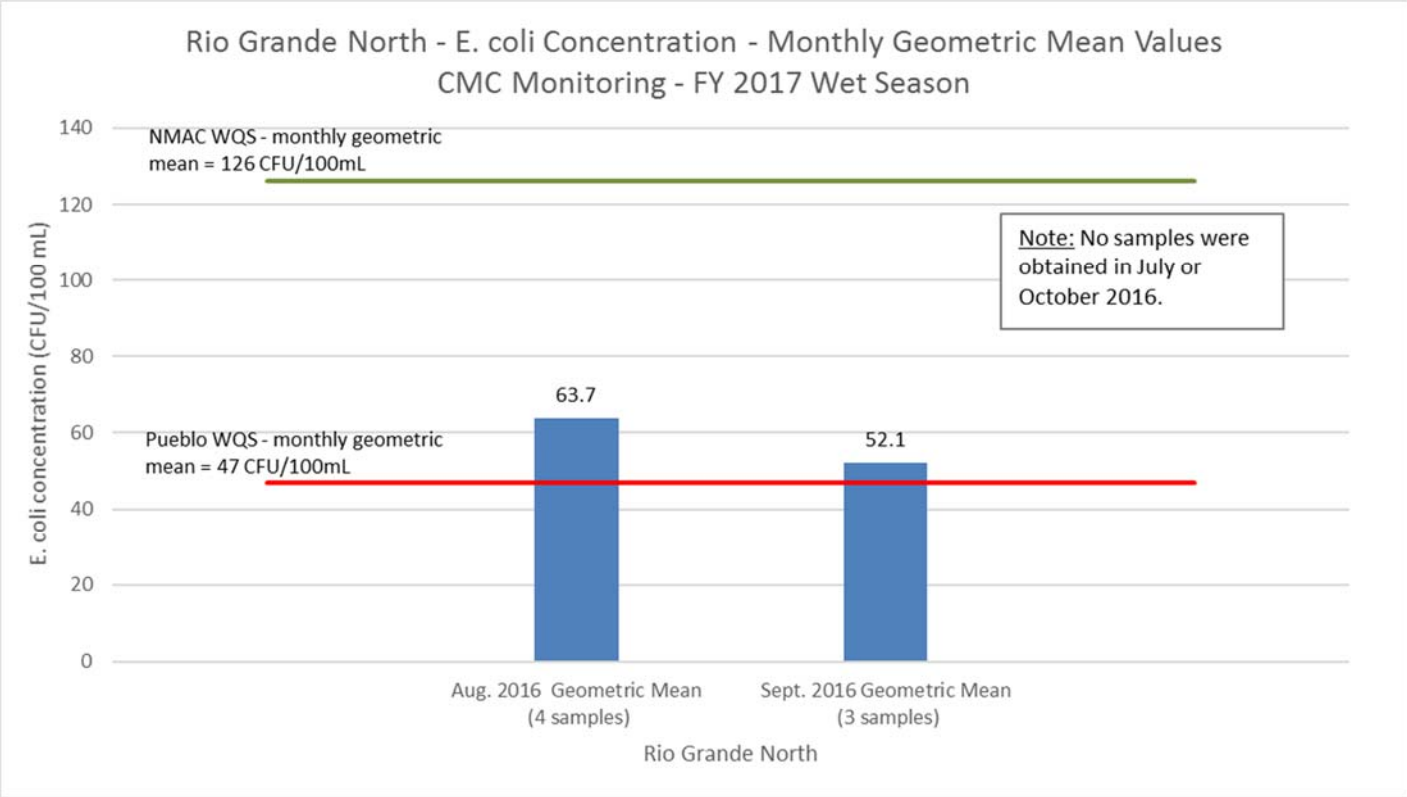


Figure 3: E. coli Geometric Mean Results for Rio Grande North CMC Monitoring – FY 2017 Wet Season

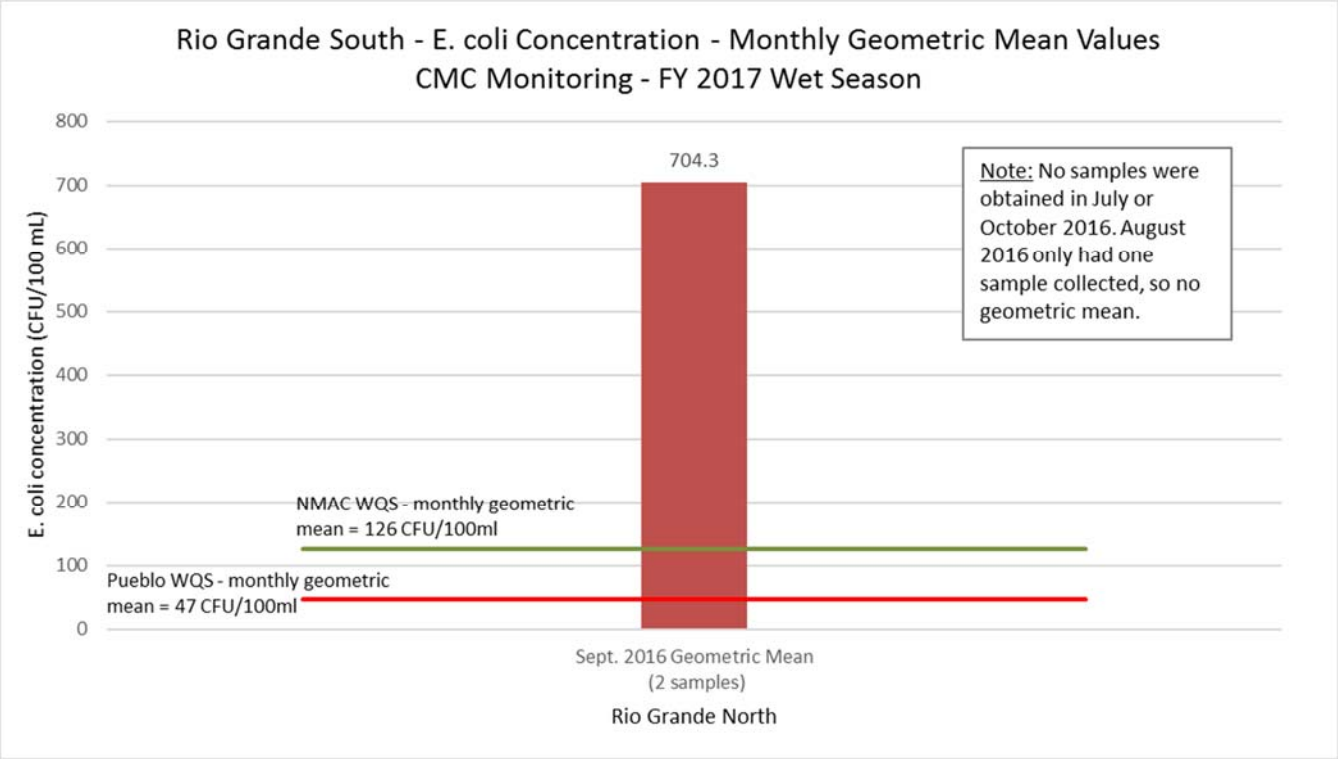


Figure 4: E. coli Geometric Mean Results for Rio Grande South CMC Monitoring – FY 2017 Wet Season

Dissolved Oxygen, PCB's and Temperature:

Three of the water quality parameters are specifically worth mentioning in this memo because they are listed in the WSB MS4 Permit, Part I.C.1 – Special Conditions: dissolved oxygen, PCBs, and temperature.

Dissolved oxygen is a water quality concern in the Rio Grande if it is below 5 mg/L. None of the samples taken from the Rio Grande during the FY 2017 wet season monitoring had dissolved oxygen values below 5 mg/L. This provides the MS4s with specific monitoring data showing that stormwater did not cause or contribute to exceedances of applicable dissolved oxygen water quality standards in the Rio Grande during the FY 2017 wet season. Refer to Figure 5 for dissolved oxygen results and comparison to applicable WQS.

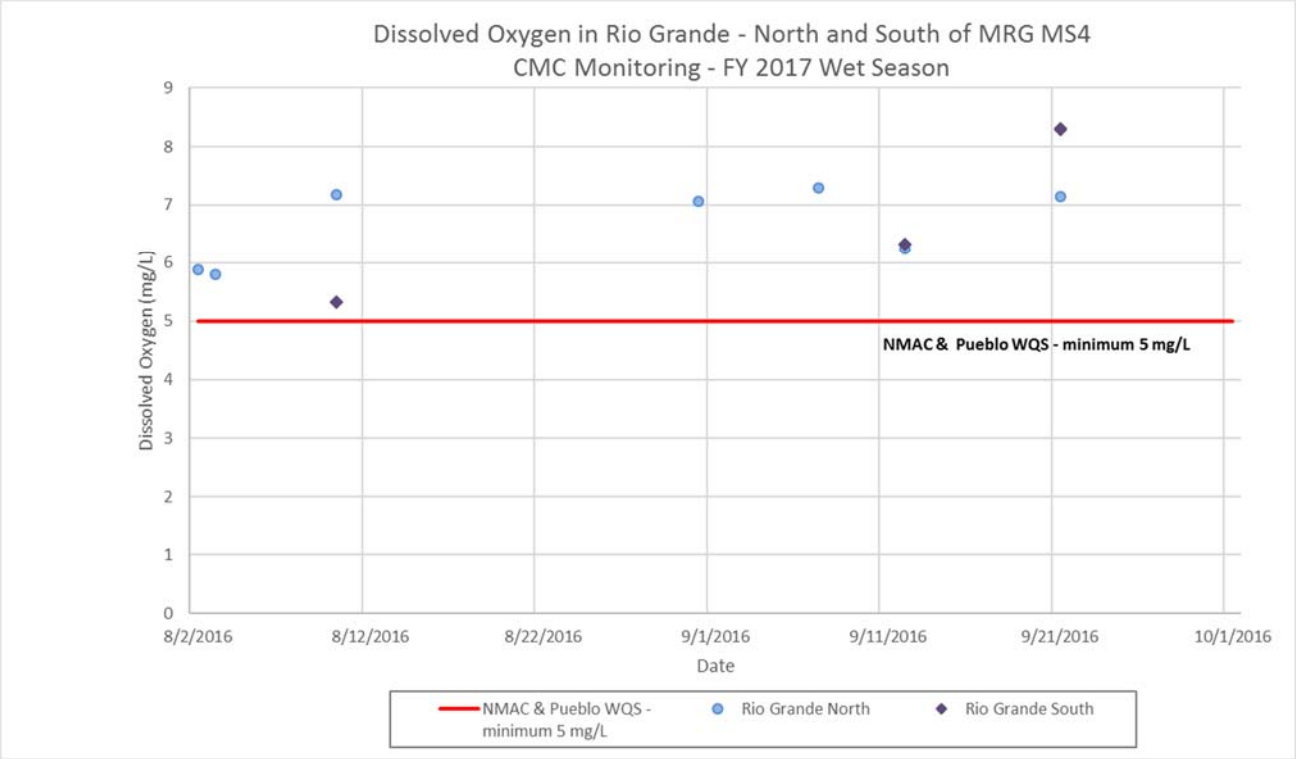


Figure 5: Dissolved Oxygen Results for Rio Grande
CMC Monitoring – FY 2017 Wet Season

For the CMC FY 2017 wet season samples, there were no exceedances of WQS for PCBs. This data can be used by the CMC members to demonstrate that stormwater discharges are not contributing to exceedances of applicable PCB water quality standards in the Rio Grande.

Temperature is listed in the WSB MS4 Permit as a special condition (only applicable to the City of Albuquerque and AMAFCA). Past data submitted to EPA and NMED has proven that stormwater discharges into the Rio Grande are not raising the Rio Grande temperature above the water quality standards. The data collected during this FY 2017 wet season monitoring supports this conclusion. All of the temperature field readings taken in the Rio Grande during the CMC FY 2017 wet season were below 32.2°C (90 °F) – the WQS for the State of New Mexico and for the Isleta and Sandia Pueblos. Refer to Figure 6 for temperature results and comparison to applicable WQS.

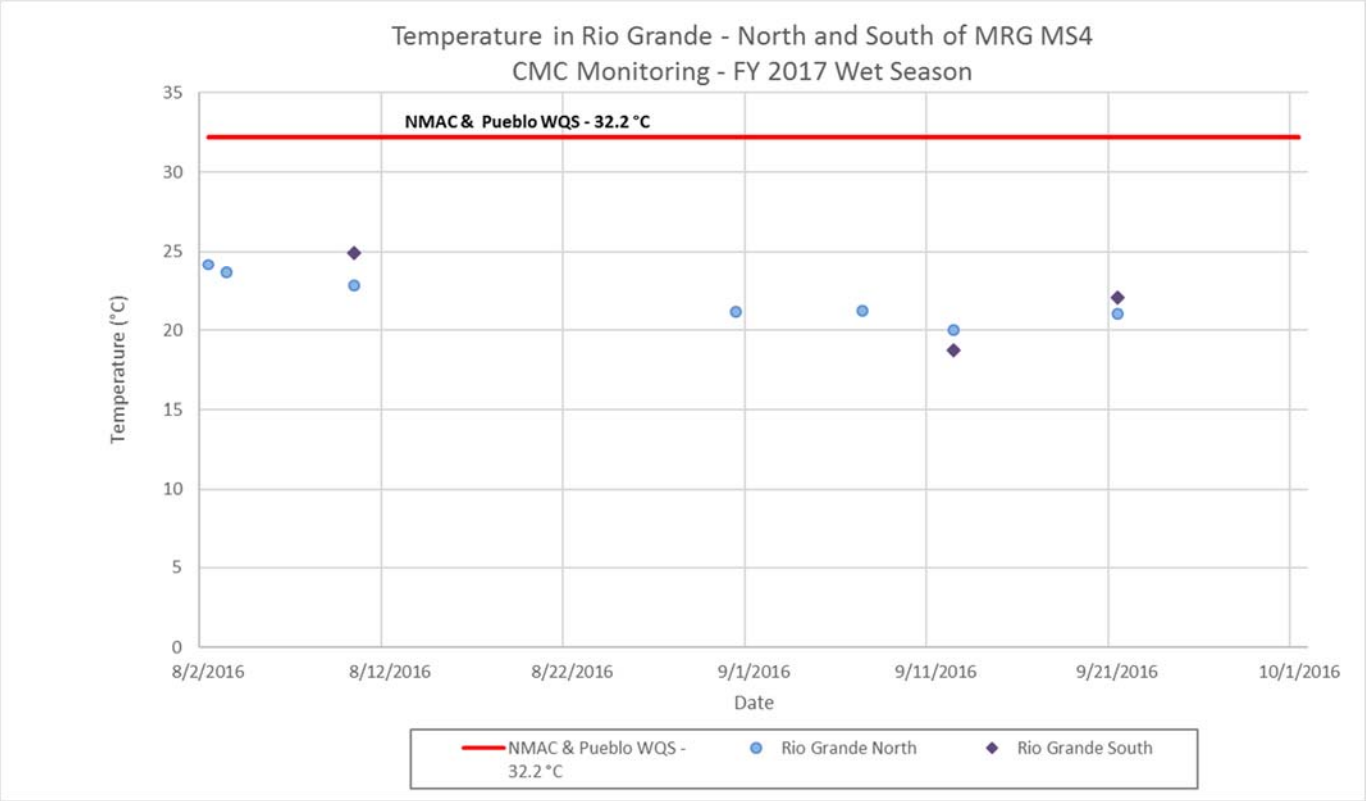


Figure 6: Temperature Monitoring Results in Rio Grande
CMC Monitoring – FY 2017 Wet Season

CMC FY 2017 Wet Season E. coli Loading Calculations and Waste Load Allocation (WLA)

Related to assessing the stormwater results, BHI has calculated the E. coli daily loading and compared it to the aggregate Total Maximum Daily Load (TMDL) Waste Load Allocation (WLA) for the CMC group. A TMDL is the maximum amount of a pollutant (E. coli in this case) that a water body (Rio Grande) can assimilate on a daily basis without violating applicable surface WQS. The total TMDL for a stream segment consists of the multiple WLA for point sources, non-point sources, and natural sources, plus a margin of safety. The CMC MS4 allotted WLA was determined in the US EPA Approved, Total Maximum Daily Load for the Middle Rio Grande Watershed, June 30, 2010, and subsequent communications with NMED. The WLA varies by flow condition in the Rio Grande and by stream segment.

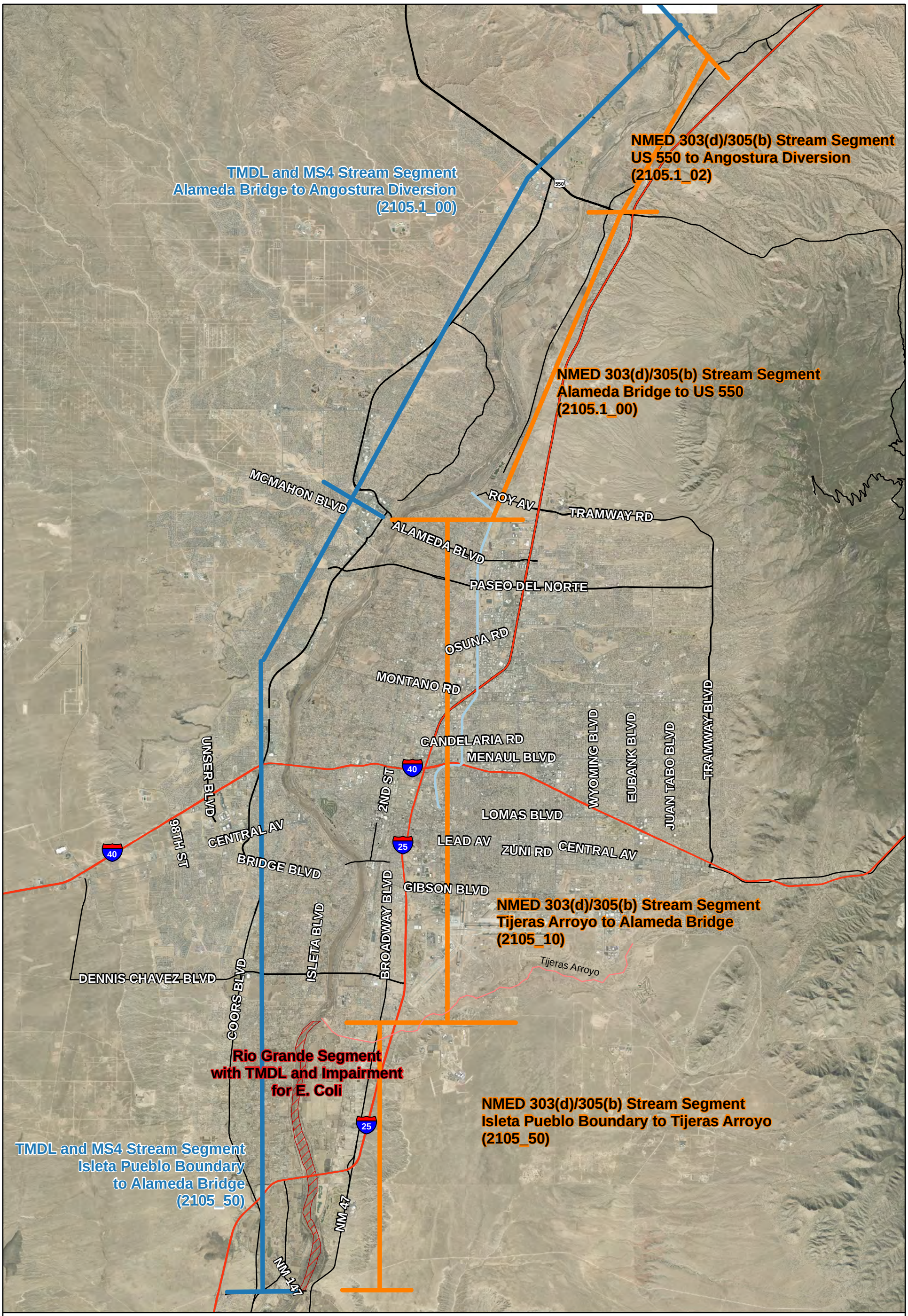
E. coli loading calculations and comparison to the WLA follows the WSB MS4 Permit requirements in "Discharges to Water Quality Impaired Water Bodies with an Approved TMDL," Part I.C.2.b.(i).(c).B, Appendix B-Total Maximum Daily Loads (TMDLs) Tables of the WSB MS4 Permit, and the NMED guidance provided to the CMC. AMAFCA also provided guidance to BHI related to the E. coli loading calculation procedure and provided an example calculation from July 2016.

Attached to this memo is the WLA Calculation spreadsheet which steps through the E. coli daily loading calculations and assumptions comparing the calculated E. coli loading to the CMC aggregate WLA defined by NMED. BHI provided the draft calculations spreadsheet for review to AMAFCA, who shared this with other CMC members, in both December 2016 and February 2017. The CMC members also met to discuss the E. coli loading calculations with NMED on February 1, 2017. Meeting minutes are included as Attachment 4 to this memo. BHI followed up with NMED on February 16, 2017, regarding specific calculation details. The current spreadsheet includes the improvements discussed at the NMED meeting and follow-up phone call. An email summarizing the February 16, 2017, conference call was sent to NMED and EPA on March 2, 2017, and a copy of this is included in Attachment 4 to this memo.

There are two (2) stream segments defined in the WSB MS4 Permit (Appendix B): Isleta Pueblo Boundary to Alameda Street Bridge (Stream Segment 2105_50) and Non-Pueblo Alameda Bridge to Angostura Diversion (Stream Segment 2105.1_00). These stream segments differ from NMED's current stream segments defined in "2016-2018 State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report," September 23, 2016. NMED currently has four (4) stream segments instead of the two (2) WSB MS4 stream segments; of the four (4) segments, only one segment has an impairment for E. coli (2105_50 Isleta Pueblo Boundary to Tijeras Arroyo). These various stream segment designations are shown in Figure 7, page 15.

NMED provided clarification at the February 1, 2017, meeting regarding the various stream segment designations. The NMED 303(d)/305(b) 2016-2018 Integrated Report tables show the most recent assessment results, and currently there is only one segment of the Rio Grande (Isleta to Tijeras) that was found to be impaired for E. coli. However, the TMDL for the other stream segments do not go away even if they are no longer impaired – the TMDL remains in place as a protective measure. TMDLs remain in effect after impairments are removed as protective measures.

The E. coli daily loading associated with the CMC group and comparison to the NMED WLA was completed for the three (3) qualifying event wet season storm events – August 10-11, 2016, September 12-13, 2016, and September 21-22, 2016. Refer to Table 2 for a summary of the WLA comparison results. A spreadsheet is attached to this memo that provides the detailed calculations.



Legend

- TMDL/MS4 Stream Segments
- NMED Stream Segments
- North Diversion Channel
- Rio Grande Segment w/ TMDL and Impairment for E. Coli
- Interstate Highway
- U.S. Highway
- State Highway

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CMC Monitoring

Figure 7
Rio Grande
NMED and MS4 Permit
Stream Segments

P:\20170386\WR\Reports\Preliminary & Draft\Figures\MXDs\Figure7-TMDLStreamSegments.mxd
Author: gmaynard

February 2017

Table 2: Summary of CMC Daily E. Coli Loading Compared to WLA for the CMC

Date / Stream Segment	Daily Mean Flow (cfs)	Flow Conditions (cfs) *range defined by NMED*	CMC Daily E. coli Load-ing (CFU/day)	NMED WLA for CMC for Stream Segment and Flow Conditions	Loading Compared to WLA Potential Exceedance or Acceptable
August 10-11, 2016 – Rio Grande North E. coli concentration = 35.9 CFU/100 mL and Rio Grande South E. coli Concentration = 1,106 CFU/100 mL					
Alameda to Angostura	639	Dry	8.32E+11	3.24E+10	Potential Exceedance
Isleta to Alameda	703	Mid	2.34E+11	4.22E+10	Potential Exceedance
September 12-13, 2016 – Rio Grande North E. coli concentration = 55.6 CFU/100 mL and Rio Grande South E. coli Concentration = 959 CFU/100 mL					
Alameda to Angostura	435	Dry	4.67E+11	3.24E+10	Potential Exceedance
Isleta to Alameda	467	Dry	1.02E+11	1.57E+10	Potential Exceedance
September 21-22, 2016 – Rio Grande North E. coli concentration = 31.1 CFU/100 mL and Rio Grande South E. coli Concentration = 517 CFU/100 mL					
Alameda to Angostura	350	Low	1.29E+11	1.68E+10	Potential Exceedance
Isleta to Alameda	251	Low	1.22E+10	3.42E+09	Potential Exceedance

As Table 2 illustrates, the E. coli loading for the three wet season events all potentially exceeded the CMC allocated WLA. The WSB MS4 Permit implies that the WLA is a measurable goal for the MS4s related to E. coli. Based on extensive review of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, this seems to be an unattainable goal for MS4s. The 2010 TMDL Report states on page 40, "It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards…Meeting the calculated TMDL may be a difficult objective." The TMDL/WLA was calculated by NMED to meet the Pueblo (Sandia and Isleta) geometric mean maximum of 47 CFU/100 mL which was done to be "protective of downstream waters" and "to provide an implicit margin of safety (MOS)." A single grab sample E. coli result meeting this very low geometric mean WQS will be very difficult for the MS4s to obtain.

The CMC members discussed the difficulty of using the WLA as a measurable goal with NMED on February 1, 2017. NMED explained that exceeding the WLA does not trigger enforcement. However, NMED strongly encouraged the MS4s to document what they are doing once they realize the WLA is potentially exceeded. The February 1, 2017, meeting and the February 16, 2017, CMC discussion with NMED demonstrate that CMC members are working toward understanding the WLA. In addition, the CMC members and NMED discussed potential

refinements to the sampling plan, demonstrating that the CMC is investigating the potential exceedances and improvements to monitor E. coli in the Rio Grande.

Data Entry for Discharge Monitoring Reports

As required in the WSB MS4 Permit, verified stormwater quality data must be submitted annually to the EPA using electronic Discharge Monitoring Report (DMR) forms. Data from the DMRs are uploaded to a comprehensive nation-wide database that contains discharge data for facilities and other point sources that discharge directly to receiving streams. Currently, the CMC members are working with the EPA regarding access and use of the NetDMR system. For this Task, BHI has not completed any data entry related to the EPA DMRs for the FY 2017 wet season.

Conclusions and Planning

During the FY 2017 wet season (July 1 to October 31, 2016), three (3) qualifying stormwater samples were obtained by the CMC. Lab results have been received for all of these samples. This data has been entered into the project Excel database. The lab data entered is marked in the spreadsheet as "V" (verified), and data V&V has been completed (refer to Attachment 2).

To summarize, monitoring results and E. coli loading calculations for the FY 2017 wet season show that:

- Three (3) of the seven (7) required samples in the WSB MS4 Permit Wet Weather Monitoring section were obtained. Seven (7) samples are required during the 5-year Permit term, so this is significant progress for the CMC. The CMC also met the required Permit minimum of three (3) events during the wet season.
- Over half of the parameters tested (18 of the 34) were not detected in any of the Rio Grande samples.
- Only E. coli was in exceedance of applicable New Mexico and Pueblos of Sandia and Isleta WQS.
    - All dissolved oxygen results were greater than 5 mg/L (minimum WQS).
    - All temperature results were less than 32.2 °C (maximum WQS).
    - There were no PCB test results exceeding the applicable WQS.
- The calculated E. coli loading for the three qualifying storm events show that the WLA for the CMC members is potentially exceeded for all three events.
    - Sources for the E. coli loading measured in the river are not solely attributable to the CMC MS4 members; the E. coli loading calculations serve to provide a reasonable estimate of the CMC contribution to the measured E. coli loading.
    - This sampling and calculation approach is only an estimate of the CMC contribution to the E. coli loading which is why the term "potential exceedance" is used.
    - The in-stream data does not provide the concentration of E. coli contributed by only the CMC MS4s, or any of the other potential sources. By using this percentage calculation approach, if other contributors are in exceedance of the WLA, then the CMC will likely also be in exceedance since this approach relies on a percentage of a total.

- A meeting was held with CMC members and NMED on February 1, 2017, to discuss the E. coli loading and WLA calculations.
- A follow-up conference call occurred with NMED on February 16, 2017, discussing details related to the E. coli loading calculations.

The dry season monitoring results and E. coli loading calculations will be summarized by BHI for the CMC in a memo due July 20, 2017.

SG/le

Attachments:

Attachment 1 – Hall Environmental Analysis Laboratory Reports with BHI Notes for FY 2017 Wet Season

Attachment 2 – FY 2017 Wet Season Completed Data Verification and Validation Forms

Attachment 3 – Documentation Related to E. coli Units MPN/100 mL and CFU/100 mL

Attachment 4 – Documentation of NMED Coordination Regarding E. coli Loading Calculations and CMC MS4 Waste Load Allocation

Spreadsheets Included Separately:

E. coli Loading and Comparison to Waste Load Allocation (WLA) Excel Spreadsheet

Excel CMC Spreadsheet with FY 2017 Wet Season Stormwater Quality Monitoring Results

ATTACHMENT 3

DOCUMENTATION RELATED TO E. COLI UNITS MPN/100ML AND CFU/100 ML

From: Holcomb, Sarah, NMENV [mailto:sarah.holcomb@state.nm.us]
Sent: Monday, February 6, 2017 8:08 AM
To: Chavez, Patrick <pchavez@amafca.org>
Subject: RE: MPN vs CFU for E.coli

Hi Patrick,
According to our Monitoring folks, MPN and CFU are interchangeable. We did propose the change in the most recent triennial:

https://www.env.nm.gov/swqb/Standards/TR2013/01a_TRPetition04-2014.pdf

Once they are approved, you might want to check with EPA for how they would like you to report moving forward.

~ Sarah

From: Chavez, Patrick [mailto:pchavez@amafca.org]
Sent: Friday, February 3, 2017 8:54 AM
To: Holcomb, Sarah, NMENV <sarah.holcomb@state.nm.us>
Subject: MPN vs CFU for E.coli

Sarah:

Here is the memo I was referring to that discusses the difference between MPN and CFU. There isn't a lab that does the CFU method in Albuquerque and so all of our results to date are MPN. The permit refers to CFU as does the water quality standard. Be nice if we were able to compare apples-to-apples since the literature suggests that MPN may be higher than when compared to CFU. Should we be applying a correction factor to our lab results and is NMED going to consider EPA's guidance (in the memo) and list the water quality standards in both MPN and CFU?

Thanks,
Patrick

Patrick Chavez, MS, PE, LEED AP+
Storm Water Quality Engineer
Albuquerque **M**etropolitan **A**rroyo **F**lood **C**ontrol **A**uthority
2600 Prospect NE
Albuquerque, New Mexico 87107

Work (505) 884-2215
Fax (505) 884-0214
Mobile (505) 362-7342

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From: Andy Freeman [mailto:andy@hallenvironmental.com]
Sent: Tuesday, January 31, 2017 3:16 PM
To: Chavez, Patrick <pchavez@amafca.org>
Subject: RE: E.coli results

Hi Patrick,

We report e.Coli enumeration using EPA Method 9223B quantitray. Our reports list e.Coli MPN, but the units say cfu/100mls. This can be confusing. It would be better for us to report as MPN/100mls.

Let me know if you have further questions on this.

Andy

From: Chavez, Patrick [mailto:pchavez@amafca.org]
Sent: Tuesday, January 31, 2017 8:19 AM
To: Andy Freeman
Subject: E.coli results

Andy:

Have a question hoping you can shed some light on concerning the difference between MPN and CFU/100ml. Have attached a lab result as an example but the question pertains to all the E.coli results that have been obtained from HEAL.

The question is: why is E.coli MPN listed as the type of test and the Units are listed as CFU/100ml? It was brought to my attention yesterday from another engineer that the result should either be MPN or CFU/100ml and that they are really two different tests? Can you clarify please?

Thanks again,
Patrick

Patrick Chavez, MS, PE, LEED AP+
Storm Water Quality Engineer
Albuquerque **M**etropolitan **A**rroyo **F**lood **C**ontrol **A**uthority
2600 Prospect NE
Albuquerque, New Mexico 87107

Work (505) 884-2215
Fax (505) 884-0214
Mobile (505) 362-7342

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NEW MEXICO
ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau

Harold Runnels Building, N2052
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-0187 Fax (505) 827-0160
www.nmenv.state.nm.us

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BUTCH TONGATE
Deputy Secretary

ERIKA SCHWENDER
Director
Resource Protection Division

MEMORANDUM

TO: Kris Pintado, Standards, Planning and Reporting Team Leader

FROM: Jodey Kougioulis, Quality Assurance Officer

DATE: February 26, 2014

SUBJECT: Triennial Review – Most probable number (MPN) and colony forming units (cfu) enumeration methods and proposed standards reporting revision

Introduction and Purpose

The purpose of this memo is to address EPA's and SWQB staff comments and suggestions regarding the reporting of bacterial concentrations as MPN and to propose suggested revisions to the state's current reporting language for bacteria criteria which are expressed as colony forming units (cfu) per 100 ml. Currently, the SWQB reports bacteria data as most probable number (MPN) per 100 ml based on the use of IDEXX *Quanti-Tray* (QT) method which is an extended version of the IDEXX Colilert test. MPN and cfu represent different enumeration methods and result in different method specific units, but for purposes of reporting, EPA has used these terms interchangeably. EPA has approved methods for enumeration and allows reporting in either cfu or MPN per 100/ml in federal rule for ambient water (40 CFR, 2003) and for wastewater and sludge (40 CFR, 2007).

Background and General Description of MPN and cfu.

The MPN is a statistical estimate of the number of bacteria that, more probable than any other number, would give the observed result; it is not an actual count of the bacteria present. Membrane filtration (MF) methods which produce results expressed as cfu are culture-based and results are quantified by counting the number of colonies that arise from bacteria captured on the membrane filter per volume of water filtered. Although expressed as an actual count of the bacterial colony forming units, the number is still considered an estimate because colonies can be produced by one or several cells that can clump together in the sample. MPN methods are also culture-based with a defined substrate which produces an estimate number (density) of organisms based on the combination of positive and negative test tube results that can be read from a statistical probability MPN table.

Proposal

The SWQB currently uses an approved EPA method for sampling and analyzing bacteria levels in its ambient water quality monitoring program and reports these results in MPN. The water quality standards for bacteria criteria are proposed to be revised to reflect SWQB's current reporting practices and EPA's approved use of either membrane filtration methods, reported as cfu, or MPN methods, reported as MPN for enumeration of bacteria in ambient water and effluent. This change, if adopted, would allow results to be reported in either cfu or MPN, depending on the analytical method. The most appropriate place to do this may be in 20.6.4.900.D and E of NMAC by adding language similar to the following: "Water quality standards for E. coli are expressed in colony forming units per 100 milliliters of water (cfu/100 ml) or as a Most Probable Number (MPN)/100 ml."

Related Research

There have been numerous published papers that address the similarities or differences between enumeration results obtained by cfu methods and those obtained by MPN methods. Much of the earlier research concluded that *"there was no significant difference for the enumeration of E. coli between the QT and MF methods" (Rompré et al., 2002).*

More recently published research by Wohlsen et al. (2006) does show a significant difference between the two enumeration methods when using a standard reference inoculum. The use and calibration of a standard reference inoculum of only viable cells still needs to be related to original criteria development which was based on a combination of frequency, magnitude, and duration of exposure to ambient recreational waters, bacterial densities as enumerated by MF, and selected illness rates in response. As stated earlier, this is primarily a reporting revision to acknowledge the programmatic reality that both MPN and cfu can be reported and used to assess against the water quality standard.

Staff and EPA Comments, Suggestions, and Initial Review of Bacteria Criteria Reporting

Responses to both the EPA, SWQB staff, and the proposal justification will need to be clearly communicated in a consistent and coordinated fashion. The need to remain consistent with existing water quality standard language, definitions, and format may limit the expanse of revised language but ultimately the simple proposed revision will communicate the available reporting options for bacteria criteria. Comments from SWQB staff largely focused on the fact that MPN and cfu are enumerated and expressed differently with method specific units and that clear definitions are needed to describe this difference. EPA's comments and suggestion are largely in concert with the proposed revision and the suggested language will provide the clarity needed for criteria interpretation.

SWQB Staff Questions and Responses

Question 1): I have come across several scholarly articles that attempt to correlate MPN to cfu. They are not the same; cfu represents an absolute number of units, whereas MPN represents a theoretical value (often considered the maximum value).

Response: *EPA permits staff and SWQB staff raised issues about the enumeration of bacteria - most probable number (MPN) and colony forming units (*cfu*) - relative to implementation and assessment of the WQS. The traditional plate tests, including membrane filtration, estimate or count 'colonies' of bacteria reported as* cfu*. These provide a direct count of an indicator organism (E. coli) in ambient water or wastewater based on the development of colonies in/on media and a calculation is still performed. While microscopic counts may be more accurate, it's costly and time consuming, and there's still the problem of what's viable or not. Very few tests are conducted to determine live and dead colonies; in summary exact counts are generally not feasible to obtain. Newer tests such as Colilert (which is used by SWQWB for assessment and monitoring) report data as MPN which is a statistical representation of what level of E. coli is likely present in a sample. While MPN and* cfu *may not be entirely equivalent, for the purposes of reporting, these terms are currently used interchangeably by the EPA. EPA has approved these methods for enumeration in federal rule for ambient water (40 CFR, 2003) and for wastewater and sludge (40 CFR, 2007). The currently recommended EPA recreational or bacteria criteria for E. coli are expressed as cfu/100 ml measured using EPA Method 1603 or any other equivalent method that measures culturable E. coli. Therefore, the water quality standards are under deliberation to be revised to reflect the use of updated methods for monitoring, assessment and reporting. After much consideration, the most appropriate place to do this may be in 20.6.4.900.D and E of NMAC by adding language similar to the following:*

> *"Water quality standards for E. coli are expressed in colony forming units per 100 milliliters of water (cfu / 100 ml) or as a Most Probable Number (MPN)/100 ml"*

References for EPA Method 1603 and EPA's final rules establishing alternate test procedures could also be included in 20.6.4.901 NMAC as references.

Abbreviations for both cfu *and MPN are suggested to be included in the WQS definitions.*

Question 2) Similar to the cfu/100mL definition, do we need to make reference to cfu/100mL in the MPN definition?
Add the term "most probable number" (under terms beginning with the letter 'M').

Response: *Generally, the definitions seem to stand on their own, e.g., there doesn't seem to be any 'cross referencing' in these definitions. Instead of adding a definition for MPN, the abbreviation for MPN is retained in this section. Please also see the previous discussion in response to bacteria enumeration (under 20.6.4.7.A (3)(a) NMAC), and response below.*

"MPN" will be listed under the abbreviations section of the definitions, so it'll be 'defined' in that way. It's also appropriate to add 'MPN' (as an alternate enumeration to cfu) under the criteria section in 20.6.4.900.D and E NMAC (see the new language in that section). As there's not a "full" definition for cfu in the WQS, to be consistent with the rule format, a "full" definition for MPN won't be added. Also, there's really not a concise, easily understood definition for cfu to put into the standards. Both enumeration methods are also fully described in the EPA criteria recommendations and supporting documents, in the methods, and in the scientific literature.

EPA Comment and SWQB Response

The Region's concern with the state's current bacteria criteria are related to how the provision reads and its interpretation. The *E. coli* standard that the state uses is expressed as colony forming units (cfu) per 100 ml. In a plain reading, this provision requires a specific test method but does not allow an alternative test. Generally the Region recommends avoiding this type of approach to test methods.

When bacterial Total Maximum Daily Loads (TMDL) are issued, they may specify extremely large numbers of cfu/100 ml as a loading limit. This requires building an equation for calculating the loading limit as expressed in the TMDL into a footnote into NPDES permits. To simplify the process, the Region has consulted with waste water treatment plant operators to determine if the most probable number (MPN) can be used as an equivalent to cfu/100 ml. The general answer is yes, and the Region has been using this approach. NMED inspectors seem to agree with this approach, since they also see the problem in the field. The problem here is that this approach requires the use of a different test method. What the Region suggests is that both the standards and TMDL guidance documents refer to both cfu/100 ml *and* MPN as equivalent, allowing either generally approved test method to be used to account the level of indicator bacteria in permits.

Response: *EPA Region 6 has suggested that the water quality standards and the state's TMDL guidance refer to both colony forming units (*cfu*) and most probable number (MPN), as EPA has approved the use of test methods with results that are expressed in either cfu or MPN. The use of more cost-effective and time efficient methods in which counts are expressed as MPN was approved by EPA as equivalent for testing ambient waters in 2003*[1] *, and for wastewater and sewage sludge in 2007*[2]*. The SWQB is currently using an approved EPA method for sampling and analyzing bacteria levels in ambient water and reporting results in MPN. The currently recommended EPA recreational or bacteria criteria for E. coli are expressed as* cfu*/100 ml measured using EPA Method 1603 or any other equivalent method that measures culturable E. coli* [3],[4]*. Therefore, the water quality standards are proposed to be revised to reflect the use of updated methods for monitoring, assessment and reporting. References for EPA Method 1603 and EPA's final rules establishing alternate test procedures may be considered for inclusion under 220.6.4.901 NMAC.*

Footnotes

1. *U.S. Federal Register* - 40 CFR Part 136 Vol. 68, No. 139; July 21, 2003.
2. *U.S. Federal Register* - 40 CFR Parts 136 and 503, Vol. 72, No. 157; March 26, 2007.
3. EPA, 2012: http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/upload/factsheet2012.pdf
4. USEPA. 2002. Method 1603: *Escherichia coli* (*E. coli*) In Water By Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC). U.S. Environmental Protection Agency, Office of Water, Washington D.C. EPA–821–R–02–023

References

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U.S. Federal Register - 40 CFR Parts 136 and 503, Vol. 72, No. 157; March 26, 2007.

USEPA, 2012:
http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/upload/factsheet2012.pdf

USEPA. 2002. Method 1603: *Escherichia coli* (*E. coli*) In Water By Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC). U.S. Environmental Protection Agency, Office of Water, Washington D.C. EPA–821–R–02–023

Wohlsen, T., Bates, J., Vesey, G., Robinson, W.A. and M. Katouli (2006) Evaluation of the methods for enumerating coliform bacteria from water samples using precise reference standards. *Letters in Applied Microbiology* **42**, 350-356.

ATTACHMENT 4

DOCUMENTATION OF NMED COORDINATION REGARDING E. COLI LOADING CALCULATIONS AND CMC MS4 WASTE LOAD ALLOCATION

Bohannan Huston

Engineering
Spatial Data
Advanced Technologies

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

MEMORANDUM

DATE: February 8, 2017

TO: Compliance Monitoring Cooperative (CMC) Members

FROM: Sarah Ganley, PE

SUBJECT: **February 1, 2017, Meeting Minutes from Meeting with NMED Regarding E. coli TMDL and CMC MS4 Waste Load Allocation**

Attendees

Sarah Holcomb, New Mexico Environment Department (NMED), Surface Water
Wano Urbanos, NMED, Assessment & TMDL Team
Kali Bronson, Bernalillo County
Patrick Chavez, AMAFCA
Kevin Daggett, City of Albuquerque
Dave Gatterman, SSCAFCA
Steven Morgenstern, NMDOT
Stephen Thies, NMDOT
Sarah Ganley, Bohannan Huston (BHI)

Purpose of Meeting

This meeting was initiated by the Compliance Monitoring Cooperative (CMC) group to discuss with NMED E. coli Total Maximum Daily Load (TMDL) in the Rio Grande, CMC MS4 Waste Load Allocation (WLA), and E. coli loading calculations in order to clarify and confirm calculation assumptions. Also, the group wanted to discuss what the E. coli loading results compared to the WLA mean for the CMC.

General Discussion of TMDL and Single Sample Results

The CMC began the discussion asking NMED for an overall explanation of the TMDL. This led to the CMC questioning the fact that the TMDL is based on daily, instream loading and that the MS4 discharge related to a storm event is not on a daily basis and also that MS4 non-point discharge is not accurately represented as an instream sample. The group also discussed that the TMDL is based on the Pueblos of Sandia and Isleta geometric mean water quality standard (WQS) of 47 CFU/100 ml.

Regarding the daily loading verses loading over a shorter storm duration, NMED's basis for the TMDL is daily loading in the river. If the CMC were to reduce the time duration for the E. coli loading, they would also need to reduce the WLA over that same time period. The E. coli loading

could not be calculated for only the storm duration and then compared to the WLA which was determined on a daily basis. The daily loading is just spreading out the E. coli concentration for a given flow rate over a day. Based on the discussions, the daily loading is appropriate for loading comparison to the TMDL and WLA.

NMED admitted that the WLA is really designed for a pipe/point source, and the instream sample for the MS4 non-point source is not completely accurate. At this time though, this is how the loading calculations and comparisons to the WLA were established and are being done. NMED seemed willing to consider other suggestions in the future, if the CMC could support a better approach. For now, this is how the TMDL and WLA for E. coli was determined.

To improve on the instream sample relevance for the MS4s, NMED suggested that another E. coli sample is needed at the stream segment divide (at Alameda). Discussion of the Santa Fe River TMDL development may have led to this suggestion. This led to a discussion on the CMC refining its sampling plan. This sampling plan refinement would need NMED and EPA approval. In addition, the CMC discussed perhaps adding pre-storm event E. coli samples to determine the condition of the river before a storm event and to help better determine what loading the MS4s are contributing during storm events.

The CMC asked how the TMDL could be based on the Pueblos' geometric mean WQS, but all of the water quality samples are single, grab samples. The comparison of the two numbers does not seem equitable. NMED stated that they must meet most stringent downstream WQSs when developing the TMDL. The geometric mean compared to the single sample was not discussed further.

The CMC members also asked NMED about reporting the monitoring values in the NetDMR system, which is set up for point source reporting. Sarah Holcomb stated that she has not had any conversations with EPA regarding this, so she is not sure about the NetDMR forms.

Stream Segment Designation Questions

The CMC group showed NMED the figure of the Rio Grande designating the two MS4 segments and the four NMED 303(d)/305(b) segments and questioned the NMED 303(d)/305(b) 2016-2018 Integrated Report tables, which do not list E. coli as a TMDL for several of the reaches. NMED explained the tables and the segments. TMDLs are separate from the NMED 303(d)/305(b) 2016-2018 Integrated Report. Based on their explanation, the segments are not contradictory.

The NMED 303(d)/305(b) 2016-2018 Integrated Report tables show the most recent assessment results, and currently, there is only one segment of the Rio Grande (Isleta to Tijeras) that was found to be impaired for E. coli. However, the TMDL for the other stream segments do not go away even if they are no longer impaired – the TMDL remains in place as a protective measure. The analogy NMDOT used to explain this was that if there was an intersection with a lot of accidents, and a stop sign or reduced speed measure was added in an effort to reduce the accidents, once the accidents were reduced, the control measure would not be removed. TMDLs remain after impairments are removed as protective measures. NMED stated that the only way a TMDL would be removed is if the water quality standard changed. NMED did state that new

assessment data or perhaps use of the CMC data could be used to revise the TMDL, but it would not be removed.

NMED stated that the fact that the E. coli impairment has been removed in several segments is a very good thing, and it's likely the MS4 work has helped with this improvement on the river. This point is a good point for CMC members to mention in their annual reporting.

The group briefly discussed why one segment (Isleta to Tijeras) was still impaired. The group asked if NMED looked for sources during the assessment. NMED explained that the NMED 303(d)/305(b) 2016-2018 Integrated Report tables list probable sources which come from staff observations, historical knowledge, and a checklist that is used during the assessments.

E. coli Loading Calculations – Questions on Assumptions

NMED clarified that the two assessment units (AUs) listed in the 2010 TMDL report are not additive – each was looked at individually during TMDL assessment. For calculations this translates to, when there is not a mid-point E. coli sample taken (as the CMC is currently operating), 77% of the instream E. coli loading is applied to the upstream reach (Alameda to Angostura), and 23% is applied to the downstream reach (Isleta to Alameda). As a reminder, currently the E. coli loading is the Rio Grande South E. coli loading minus the Rio Grande North E. coli loading. The draft of the E. coli loading spreadsheet incorrectly assumed the reaches were additive and had applied 100% to the lower reach (Isleta to Alameda)—this was corrected after this meeting. The refined sampling plan (discussed above) would add an intermediate E. coli sample, and the 77% and 23% discussed above would no longer be needed in the loading calculations.

We also briefly discussed that with the way the Rio Grande is operated, flow downstream (using the USGS gage at Central) is not necessarily higher than flow upstream (using the USGS gage at Alameda). This could result in a negative loading. The group's calculation spreadsheet will be updated to not allow negative loading.

WLA Exceedance When no Storm Event

The CMC pointed out that they had upstream and downstream E. coli results for non-storm events and analysis of these loading results show that the CMC WLA was exceeded even in "dry," non-storm event conditions. NMED stated that you would never analyze non-storm event flows related to the CMC, and the CMC could not be in exceedance. The CMC's point that the "dry" exceedances show that the river E. coli issues are likely not correctly attributed to the MS4s was not fully understood/accepted by NMED during the meeting. NMED focused on the fact the MS4s would never look at "dry" conditions or be in exceedance of any WLAs in "dry," non-storm event conditions.

This led to a brief discussion on if MS4s could be contributing to the E. coli loading during non-storm conditions (illicit discharges, septic systems, etc.). This led to a discussion by the CMC members of potentially conducting one day of watershed-wide dry weather inspections at the same time as sampling the E. coli upstream and downstream (maybe at the mid-point also) of the MS4. The dry weather screening would give assurance that no (or minimal) illicit discharges or non-stormwater flows were contributing to the river at the time of the samples. Then the river E.

coli samples could be assessed with assurance that the MS4 was not contributing runoff and the results would only be attributable to point sources and background sources.

What Does WLA Exceedance Mean for CMC

The CMC discussed that the WLA seems unattainable. The NMED 2010 TMDL reports state this is a “difficult objective.” Some of the reasons discussed regarding the WLA as a poor measurable goal include: the basis of the TMDL/WLA (the Pueblo geometric mean), the instream and single grab sample used in the calculation, and the fact that the “dry,” non-storm event conditions E. coli analyses show exceedances that are not attributable to the MS4s. NMED suggested including these concerns in the EPA annual reports along with the results.

AMAFCA asked if the WLA was always going to be exceeded should NMED consider issuing advisories. There were no real responses to the advisory discussion.

NMED explained that exceeding the WLA does not trigger enforcement. However, the MS4s need to document what they are doing once they realize the WLA is exceeded. First, this meeting and CMC discussion with NMED demonstrate that CMC members are working toward understanding and improvement. In addition, the suggested refinements to the sampling plan (discussed above) show that the CMC is investigating the exceedance. The proposed one day, watershed-wide dry weather inspections would be another step to show actions taken to further investigate the exceedance. In addition, NMED mentioned looking at Best Management Practices (BMPs) and how those could improve. Also, NMED suggested that the CMC members document all of these actions in their annual reports.

Potential Upcoming TMDLs Discussion

At the end of the meeting, the CMC group asked about the estimated 2017 TMDLs listed in the NMED 303(d)/305(b) 2016-2018 Integrated Report tables and what to expect regarding those. NMED stated that these are not current priorities and will not occur in 2017. The discussion is important because, as discussed earlier, once a TMDL is issued, it does not go away. In addition, MS4s cannot really remove themselves from a TMDL; since runoff occurs, it has to have a WLA. Bernalillo County was particularly interested in this regarding the Tijeras Arroyo and a future TMDL for nutrients. Even though the County has data showing runoff is not contributing to the nutrient issue, they would still be given a WLA in the future TMDL.

SG/le
Attachment

Attachment 1 – Meeting Agenda

ATTACHMENT 1
MEETING AGENDA

Bohannan Huston

Engineering
Spatial Data
Advanced Technologies

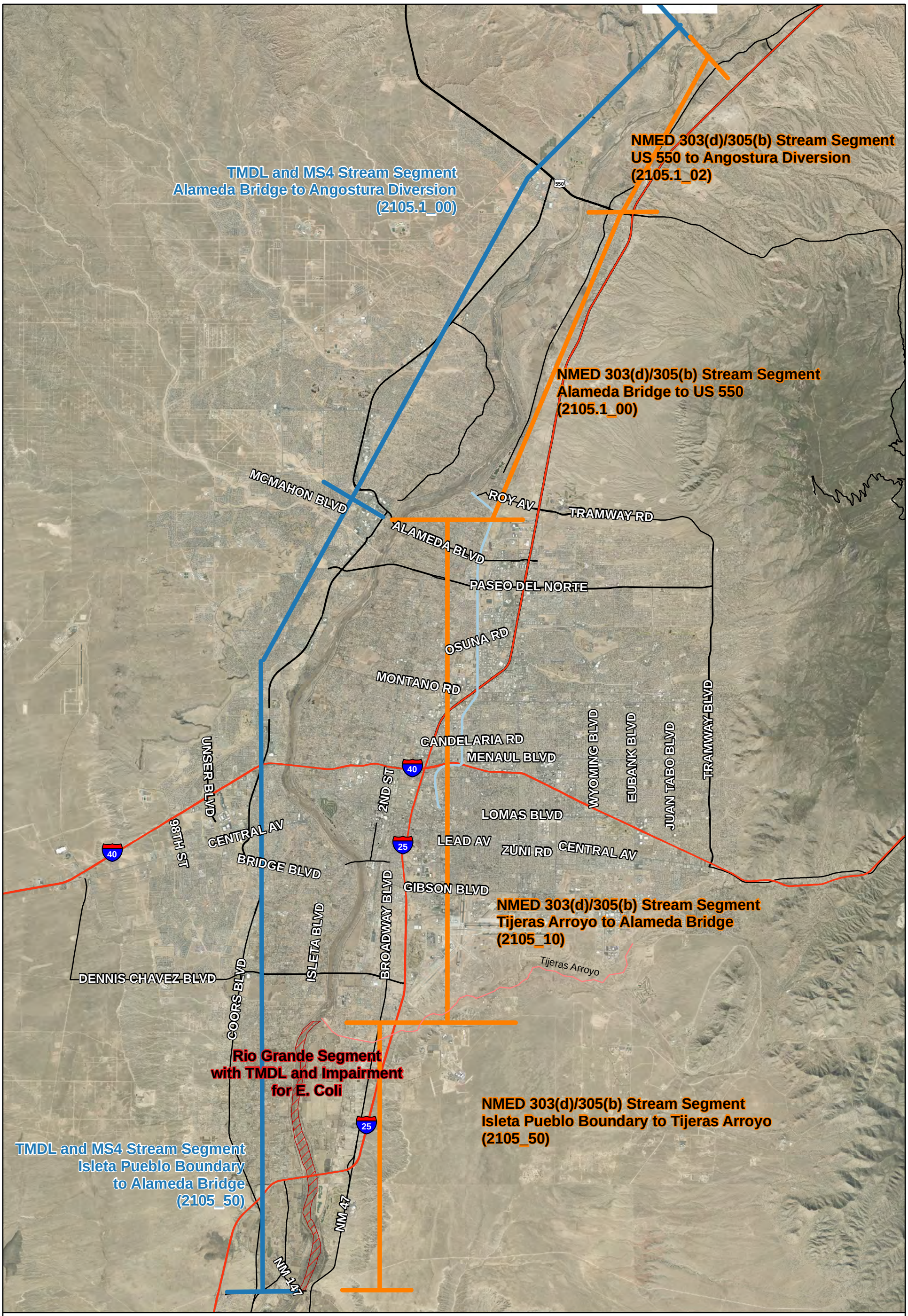
Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

CMC Stormwater Quality Monitoring –
E. coli Loading and TMDL/WLA Discussion with NMED

NMED
Wednesday, February 1, 2017
9:30 am

Meeting Objective: Discuss E. coli TMDL in Rio Grande, CMC MS4 WLA, and E. coli loading calculations with NMED in order to clarify and confirm calculation assumptions. Also, discuss what the E. coli loading results mean for the CMC.

General Discussion of TMDL and Single Sample Results	Single sample and how one result translates/compares to the instream TMDL CMC has single sample for determining the E. coli loading – TMDL based on Pueblo geometric maximum mean value of 47 CFU/100 ml E. coli loading – daily loading compared to loading over the storm event duration NetDMR reporting – set up for point source reporting
Stream Segment Designation Questions	Compare MS4 and NMED §303(d)/§305(b) Integrated Report segment designations Question on NMED §303(d)/§305(b) Integrated Report listing of E. coli TMDLs
E. coli Loading Calculations – Questions on Assumptions	Flow regime designations – 2010 TMDL Report vs. NMED e-mail Confirm understanding and application of Jurisdictional Area Approach Delta in E. coli loading (north sample minus south sample) – this could be negative because of how Rio Grande is operated (flows can decrease downstream) Upstream exceedance – WLA only considers the delta in loading
WLA Exceedance When no Storm Event	Examples from Wet Season (July 2016) and Dry Season (Dec. 2016) E. coli data in 2010 TMDL Report – not related to storm events
What Does WLA Exceedance Mean for CMC	Need to calculate E. coli loading & compare to WLA – Required in MS4 Permit. Discuss what a calculated exceedance mean for the MS4s?



Legend

- TMDL/MS4 Stream Segments
- NMED Stream Segments
- North Diversion Channel
- Rio Grande Segment w/ TMDL and Impairment for E. Coli
- Interstate Highway
- U.S. Highway
- State Highway

AMAFCA

Bohannan Huston
www.bhinc.com 800.877.5332

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CMC Monitoring

Figure 7
Rio Grande
NMED and MS4 Permit
Stream Segments

P:\20170386\WR\Reports\Preliminary & Draft\Figures\MXDs\Figure7-TMDLStreamSegments.mxd
Author: gmaynard

February 2017

Sarah Ganley

From: Sarah Ganley
Sent: Thursday, March 02, 2017 9:42 AM
To: 'smith.nelly@epa.gov'
Cc: Chavez, Patrick (pchavez@amafca.org); Sarah Holcomb (sarah.holcomb@state.nm.us)
Subject: FW: MS4 CMC E. coli Loading Calculation Follow-Up
Attachments: CMC E coli Loading Percentage Calculation 3_2_17.xlsx

Hello Nelly –

I am forwarding you this e-mail to keep you informed of on-going coordination between the Middle Rio Grande Stormwater MS4 Compliance Monitoring Cooperative (CMC) and NMED regarding E. coli loading calculations and comparison to the TMDL WLA values in the Rio Grande.

Thank you,

Sarah J. Ganley, PE
Engineer
Water Resources
Direct line: 505-923-3314

Bohannan Huston
Courtyard I
7500 Jefferson St. NE
Albuquerque, NM 87109-4335
www.bhinc.com
voice: 505.823.1000 **facsimile:** 505.798.7988 **toll free:** 800.877.5332

From: Sarah Ganley
Sent: Thursday, March 02, 2017 9:30 AM
To: Sarah Holcomb (sarah.holcomb@state.nm.us) <sarah.holcomb@state.nm.us>; Henderson, Heidi, NMENV <heidi.henderson@state.nm.us>; wayne.urbonas@state.nm.us
Cc: Chavez, Patrick (pchavez@amafca.org) <pchavez@amafca.org>
Subject: MS4 CMC E. coli Loading Calculation Follow-Up

Hello Sarah, Heidi, and Wano,

Thank you for taking the time for a conference call on February 16, 2017 with myself and Patrick Chavez regarding the Middle Rio Grande Stormwater MS4 Compliance Monitoring Cooperative (CMC) E. coli loading calculations and comparison to the TMDL WLA values in the Rio Grande.

After our conversation, we went back and re-checked our approach, made one modification, and added notes/clarifications to our calculations spreadsheet. I have attached an updated spreadsheet to this e-mail for your reference.

As a summary of what we discussed on February 16th:

- Sources for the E. coli loading measured in the river are not solely attributable to the CMC MS4 members; the calculations we presented serve to provide a reasonable estimate of the CMC contribution to the measured E. coli loading.
- The measured E. coli loading is attributable to point sources (Town of Bernalillo WWTP, City of Rio Rancho WWTP No. 2, City of Rio Rancho WWTP No. 3, Albuquerque Bernalillo Water Utility Authority, and Sandia Peak Ski Co.), as well as non-point sources such as MS4 contributions and natural background contributions.
- An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA values.
- We presented reasoning for why the 6% and 10% values from the US EPA Approved Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Appendix F are not applicable estimations for this approach because these percentages do not consider the point source contributions to the measured E. coli loading. They make sense regarding the WLA determination, but not when looking at this from an in-stream E. coli loading determination.
- We presented alternative percentages of contribution – and as mentioned earlier, modified these after our conversation with you – that calculate a percentage of the CMC WLA value divided by the TMDL minus the MOS. This percentage represents an estimate of the percent of the CMC E. coli loading to all of the E. coli contributors (point sources, MS4s, and natural background). This percentage allows a reasonable estimation of the percent of the E. coli loading that is attributable to the CMC MS4s. Since our discussion, we removed the MOS from our percentage calculation.
- Using the above approach, the CMC then has an E. coli loading value to compare to the applicable WLA values, for a given stream segment and flow regime.
- The percentages of contribution that are presented for the upper stream segment (Alameda to Angostura) are essentially 6%, the same value presented in Appendix F of the 2010 US EPA Approved TMDL. The point sources in this stream segment are small (0 to 3% of the total TMDL), so although the jurisdictional area percentage presented in Appendix F did not include point sources, the effect is negligible. The pie charts in the attached spreadsheet help to illustrate this.
- The percentages of contribution that are presented for the lower stream segment (Isleta to Alameda) range from 1.8% to 6.5%. In Appendix F of the 2010 US EPA Approved TMDL and the NMED Nov. 2016 e-mail, the CMC value would be 6.7%. The greater difference in percentages in this stream segment is due to the presence of significant point sources (specifically the ABCWUA), which are relatively large contributors (2.5% to 70.7%, depending on the flow regime) to the total TMDL; therefore, because the percentage presented in Appendix F did not account for point sources, the impact to the calculated percent contribution by the CMC members can be significant.
- This approach is only an estimate of the CMC contribution to the E. coli loading. We do not know from the in-stream data the concentration of E. coli contributed by the CMC MS4s, or any of the other potential sources. By using this percentage approach, if other contributors are in exceedance of the WLA then the CMC will likely also be in exceedance since this approach relies on a percentage of a total. Therefore, the data collected by the CMC could not be used to determine the source causing the exceedance.

You left me a voicemail regarding the application of these percentages if and when the CMC adds a mid-point E. coli sample to their sampling program. To clarify:

- The percentages presented above and discussed during our conference call will still need to be applied if and when the CMC adds a mid-point E. coli sample to their sampling program. These percentages are to estimate how much of the total measured E. coli loading applies to the CMC MS4s.
- The TMDL was determined for two river segments, so each segment has different WLAs for the CMC; therefore, we currently divide the measured E. coli loading between these two segments so that they can be compared to the applicable WLA. The jurisdictional area from Appendix F of the 2010 US EPA Approved TMDL was used to estimate the percent of E. coli loading attributable to the northern segment (Alameda to Angostura) and the southern segment (Isleta to Alameda) of the Middle Rio Grande – 77% and 23%, respectively. If and when the

CMC adds a mid-point E. coli sample to their sampling program, these percentages will no longer need to be applied to the CMC E. coli loading calculation.

Thank you again for taking the time to discuss and review the CMC E. coli loading approach and calculations. We are moving forward with this E. coli loading approach. Please let me know if you have any questions or I can provide additional information or rational for this approach.

Sarah J. Ganley, PE
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Water Resources
Direct line: 505-923-3314

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Courtyard I
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Sarah Ganley

From: Holcomb, Sarah, NMENV <sarah.holcomb@state.nm.us>
Sent: Thursday, March 02, 2017 1:20 PM
To: Sarah Ganley; Henderson, Heidi, NMENV; Urbonas, Wayne, NMENV
Cc: Chavez, Patrick (pchavez@amafca.org); Smith, Nelly (Smith.Nelly@epa.gov)
Subject: RE: MS4 CMC E. coli Loading Calculation Follow-Up

Hi Sarah & Patrick:

Thanks for the email. I think this is a good approach to estimating the CMC's contribution in stormwater. If there continue to be exceedances of the benchmark, then perhaps it may be a worthwhile discussion to refine the math at work here and look closer at conditions the day of monitoring. But we'll cross that bridge when we come to it.

I also wanted to ask when the CMC will add the additional monitoring location (for E. coli only) at the AU break.. I believe this should be documented in your next annual report, but this shouldn't require re-approval of the monitoring plan overall. Nelly, do you agree?

~ Sarah

From: Sarah Ganley [mailto:sganley@bhinc.com]
Sent: Thursday, March 2, 2017 9:30 AM
To: Holcomb, Sarah, NMENV <sarah.holcomb@state.nm.us>; Henderson, Heidi, NMENV <heidi.henderson@state.nm.us>; wayne.urbanos@state.nm.us
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Sarah J. Ganley, PE
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Direct line: 505-923-3314

Bohannan Huston

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM 87109-4335
www.bhinc.com

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Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
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MEMORANDUM

DATE: July 12, 2017

TO: Jerry Lovato, PE, AMAFCA
Patrick Chavez, PE, AMAFCA

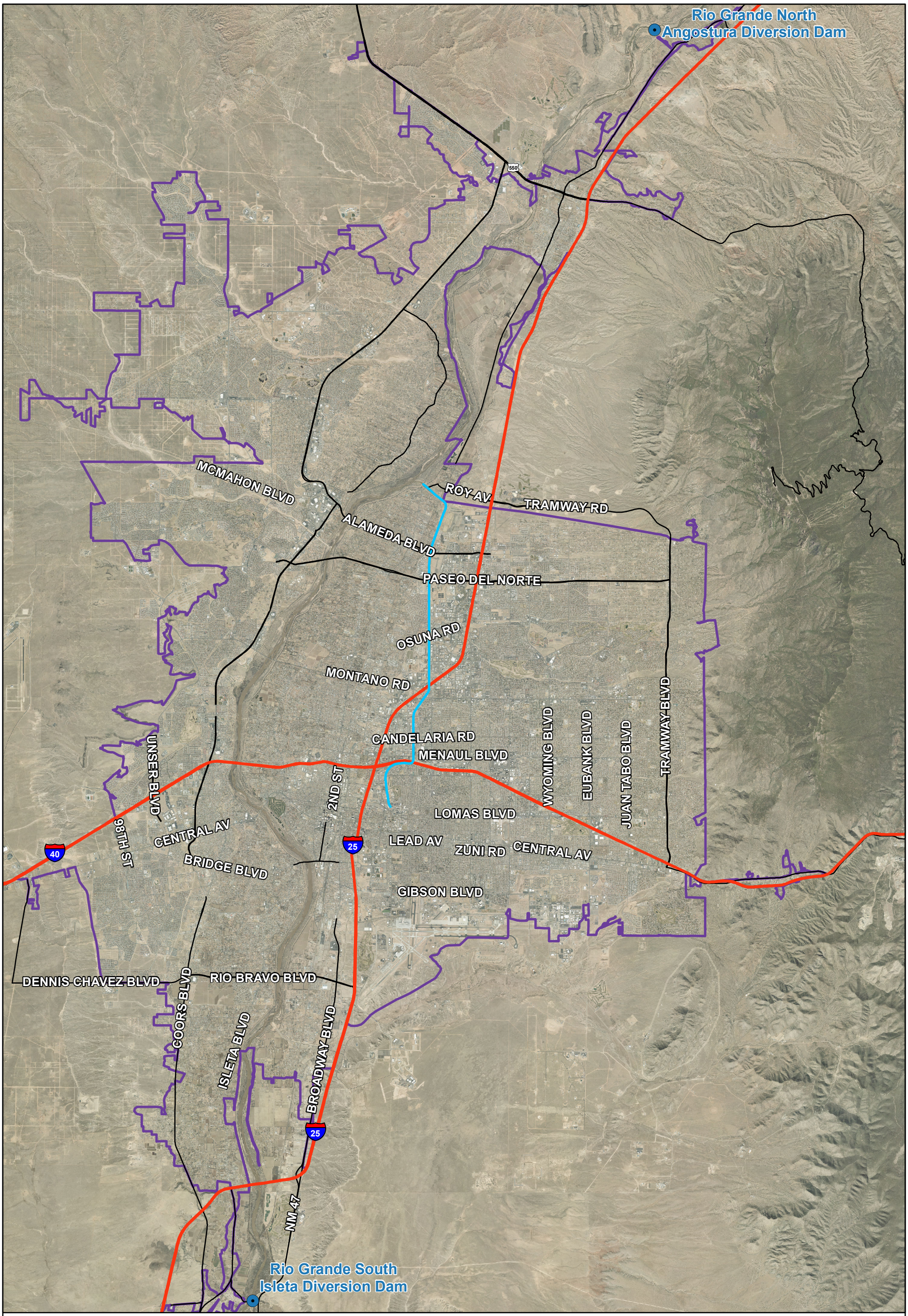
FROM: Craig Hoover, PE
Sarah Ganley, PE

SUBJECT: **CMC Dry Season, Wet Weather Stormwater Monitoring Data Verification, Analysis Results Database, and Reporting FY 2017 Dry Season (November 1, 2016, to June 30, 2017) Memo**

Overview of Stormwater Monitoring Activity

Bohannan Huston, Inc. (BHI) has been tasked to perform water quality services for the Compliance Monitoring Cooperative (CMC) Stormwater Data Verification, Database, and Reporting for the Wet Weather Stormwater Quality Monitoring Program for Fiscal Year (FY) 2017 (July 1, 2016, to June 30, 2017). The scope of work for this task includes data verification of the stormwater laboratory analysis results, compiling the analysis results into a database, and calculating the E. coli daily loading to compare with the Waste Load Allocation (WLA) for the qualifying storm events. The stormwater compliance monitoring is being conducted separately by Daniel B. Stephens & Associates, Inc. (DBS&A) and is not a part of this on-call task. This task is being conducted to assist the CMC members with their comprehensive monitoring and assessment program for compliance under the 2014 Middle Rio Grande Watershed Based Municipal Separate Storm Sewer System (MS4) Permit, NPDES Permit No. NMR04A000 ("WSB MS4 Permit").

As identified in the CMC Monitoring Plan, the WSB MS4 Permit requires that a minimum of seven (7) storm events be sampled at both the Rio Grande North and Rio Grande South locations (refer to Figure 1, page 2). During the 5-year WSB MS4 Permit term, at least three (3) events must be sampled in the wet season (between July 1 and October 31, 2016) and at least two (2) events in the dry season (between November and June). The remaining two (2) required events can be obtained during either the wet or dry seasons. During the FY 2017 dry season (November 2016 through June 2017) there was one (1) qualifying storm event where samples were collected for both the Rio Grande North and Rio Grande South locations.



Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- CMC Monitoring Locations
- North Diversion Channel
- Albuquerque Urbanized Area
- Interstate Highway
- U.S. Highway
- State Highway

N W E S

0 0.5 1 2

Miles

CMC Monitoring Locations

Figure 1

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Author: gmaynard

July 2017

Summary of the CMC Sampling Plan

Sampling Parameters:

Samples from both the Rio Grande North and Rio Grande South monitoring locations were analyzed for the parameters defined in the EPA approved WSB MS4 CMC Monitoring Plan, May 5, 2016. The parameter list for both locations, which is intended to characterize stormwater discharges into the river, is as follows:

Total Suspended Solids (TSS)
Total Dissolved Solids (TDS)
Chemical Oxygen Demand (COD)
Biological Oxygen Demand – 5-day (BOD_5)
Dissolved Oxygen (DO)
Oil & grease (N-Hexane Extractable Material)
E. coli
pH
Total Kjeldahl Nitrogen (TKN)
Nitrate plus Nitrite
Dissolved Phosphorus
Ammonia plus Organic Nitrogen (Nitrogen, Ammonia and Nitrogen, Total)
Phosphorous (Total Phosphorous)
Polychlorinated Biphenyls (PCBs – Method 1668A)
Gross Alpha
Tetrahydrofuran
Benzo(a)pyrene
Benzo(b)fluoranthene (3, 4 Benzofluoranthene)
Benzo(k)fluoranthene
Chrysene
lndeno(1 ,2,3-cd)pyrene
Dieldrin
Pentachlorophenol
Benzidine
Benzo(a)anthracene
Dibenzofuran
Dibenzo(a, h)anthracene
Chromium VI (Hexavalent)
Copper – Dissolved
Lead – Dissolved
Bis(2-ethylhexyl)phthalate
Conductivity
Temperature
Hardness (as CaCO3) – added to allow dissolved metal results to be compared to the applicable water quality standards

DO, pH, conductivity, and temperature are required by the WSB MS4 Permit to be analyzed in the field during sample collection, which was conducted by DBS&A, within fifteen (15) minutes of sample collection. All E. coli samples were submitted to the laboratory within six (6) hours of collection in order to meet the specified hold time.

Sampling Locations:

The sampling locations are shown in Figure 1, page 2.

Rio Grande North – Instream sampling within the Rio Grande was performed upstream of the Angostura Diversion Dam at the north end of the watershed. The location is upstream of all inputs from the Urban Area (UA) to the river and provides the background water conditions.

Rio Grande South – Instream sampling within the Rio Grande was performed at the Isleta Bridge at the south end of the watershed. The location is downstream of all inputs from the UA to the river and provides the downstream water conditions.

These locations have been accepted by EPA and New Mexico Environment Department (NMED) to meet the WSB MS4 Permit requirements in Part III.A. These North and South instream sample locations capture all inputs to the Rio Grande within the UA.

Sample Collection:

As mentioned previously, sample collection for the CMC is being conducted by DBS&A through a separate on-call contract. Since BHI was not involved, this task and memo do not address the details of the methodologies regarding sampling, determining if an event was a qualifying storm event, or determining the timing of the hydrograph at the Rio Grande South location. After the November qualifying storm event sample was obtained, the CMC instructed DBS&A to stop sample collection during the remainder of the dry season.

DBS&A provided BHI with their field notes and field sample data (temperature, DO, specific conductivity, and pH) for the FY 2017 dry season sampling. AMAFCA provided BHI the completed laboratory analysis reports from Hall Environmental Analysis Laboratory (HEAL) for this monitoring season.

Quality Assurance Project Plan (QAPP):

AMAFCA provided BHI with the Draft Quality Assurance Project Plan (QAPP) for the CMC dated June 14, 2016. DBS&A followed this QAPP during sample collection. BHI used this QAPP and the included standard operating procedures (SOPs) for the data verification and validation.

Monitoring Activity & Lab Analysis Summary

The list below provides a chronological summary of the CMC comprehensive monitoring program activities completed by DBS&A for the FY 2017 dry season from November 2016 through June 2017. One (1) qualifying storm event was sampled and analyzed during the FY 2017 dry season.

- **November 3 – Only E. coli for Rio Grande North.** A sample was collected at the Rio Grande North location and sent to the laboratory for an E. coli only test. Based on review of the storm event by the CMC, it was determined this was not a qualifying storm event; therefore, full parameter testing did not occur for the sample collected at the Rio Grande North location.
- **November 21-22 – Qualifying Storm Event – Full Analysis of Samples**. A sample was collected at the Rio Grande North location beginning at 9:30 a.m. on November 21 and sent to the laboratory for an E. coli only test. The CMC determined that the storm event

beginning November 21 was a qualifying storm event. A Rio Grande South sample was collected beginning at 7:00 a.m. on November 22; the samples from the North (from November 21 collection) and South locations were taken to the laboratory for full parameter testing.

Stormwater Quality Database for CMC

As stated previously, there was one (1) qualifying storm event sampled during the FY 2017 dry season, wet weather monitoring which occurred November 21-22, 2016. DBS&A's field notes containing DO, pH, conductivity, and temperature measurements, as well as comments for the sampling done in November, have been received, and field results have been added to the database. Additionally, the HEAL reports for the corresponding time period have been received, added to the database, and are provided with this memo (Attachment 1). The laboratory reports attached to this memo have BHI added comments including the field parameter measurements and other relevant notes related to each laboratory report.

The HEAL analyses for the one (1) qualifying storm event contain the full parameter list for both the Rio Grande North and Rio Grande South sampling locations. There was one other precipitation event in November 2016 that did not evolve into qualifying storm events; however, an E. coli sample was still collected and field data was measured for the Rio Grande North location. The HEAL lab reports are provided with this memo (Attachment 1). Despite not being qualifying storm events, the field and E. coli data collected were added to the database as they provide additional background data for the CMC program.

Database Creation and Data Entry:

An Excel database of the FY 2017 wet weather monitoring data was created for this Task and provided with the March 6, 2017 FY 2017 Wet Season Memo. The November 2016 dry season monitoring data has been added to this database. The database contains sample locations (Rio Grande North and Rio Grande South), sample date, analyses conducted, methods used, applicable surface water quality standards (WQS), WSB MS4 Permit required Minimum Quantification Levels (MQL), and analysis results. Applicable surface WQS found in New Mexico Administrative Code (NMAC) 20.6.4, as well as the Pueblo of Isleta and Pueblo of Sandia WQS, are entered in the Excel database for comparison purposes with testing results. There is an indicator in the database to show if the monitoring results exceed the applicable surface WQS. An exceedance is not a violation of the WSB MS4 Permit, as the Permit does not have numeric discharge limitations. These ">WQ Standard" flags simply and quickly show the CMC members where the results of the lab data exceed the applicable surface WQS.

Upon receipt of the HEAL lab reports, water quality data was entered into the database. All data entered into the database is initially denoted with a "P" to indicate that it is provisional and has not been through the verification and validation process yet. Full parameter analyses of the qualifying storm event for both Rio Grande North and Rio Grande South locations were entered respectively into the database. In addition, the E. coli and field data only samples from the Rio Grande North location, obtained during one non-qualifying storm event, were also entered into the database.

Data Verification and Validation:

The HEAL laboratory analysis reports were provided to BHI by AMAFCA. The lab reports also contain the Chain of Custody for the submitted samples. Field data was requested by and

provided to BHI by DBS&A. Data verification and validation (V & V) was conducted by BHI on all field notes, lab reports, and Chain of Custody documents in accordance with the CMC Water Quality Standard Operating Procedure (SOP) #2, which is part of the existing CMC QAPP, Draft June 14, 2016. These procedures are based on EPA Guidance for Environmental Data Verification and Validation (U.S. EPA, 2008).

As stated in the QAPP, the V & V process was completed by a different person than the one who entered the data into the database. The V & V process included use of the *Data Verification and Validation Worksheet* (provided in the QAPP). For this task, field data was verified first, confirming that all field notes were complete. BHI handled field parameter questions directly with DBS&A. Chemical data verification began as soon as the lab reports were received, checking that all parameters were tested and looking for any obvious exceedances of surface WQS. Other steps listed on the *Data Verification and Validation Worksheet* were completed after all data from the laboratory was received and entered into the database. Sample blank results were reviewed to identify potential contamination during field processing or transport. Replica/duplicate samples were evaluated based on relative percent difference (as described in more detail in the QAPP) to determine the variability of the samples.

There were not any CMC FY 2017 dry season data that did not meet the appropriate QA/QC requirements. If there were any data that did not meet the appropriate QA/QC requirements, it would have been assigned an appropriate laboratory qualifier or validation code. A summary of validation codes is provided in the QAPP.

Once the V & V process was completed, the worksheets were signed. Copies of the V & V worksheets are provided with this memo (Attachment 2). In the database, data that was checked during the V & V process was then changed from being denoted with a “P” for provisional to a “V” for verified, and laboratory qualifiers were added as needed.

CMC FY 2017 Dry Season Assessment and Evaluation of Monitoring Results

The EPA approved WSB MS4 CMC Monitoring Plan, May 5, 2016, has thirty-four (34) parameters to monitor at the Rio Grande North and Rio Grande South monitoring locations. Of these thirty-four (34) parameters (which include four field parameters), over half of the parameters—eighteen (18) parameters—were not detected in the FY 2017 dry season samples at either the Rio Grande North or South locations. Refer to Table 1 for a list of the parameters that were not detected.

Table 1: Parameters Not Detected
CMC FY 2017 Dry Season Monitoring

Parameters Not Detected	
Oil and Grease (N-Hexane Extractable Material)	Pentachlorophenol
Ammonia (mg/L as N)	Benzidine
Tetrahydrofuran	Benzo(a)anthracene
Benzo(a)pyrene	Dibenzofuran
Benzo(b)fluoranthene (3, 4 Benzofluoranthene)	Dibenzo(a,h)anthracene
Benzo(k)fluoranthene	Chromium VI (Hexavalent)
Chrysene	Dissolved Copper
Indeno(1,2,3-cd)Pyrene	Dissolved Lead
Dieldren	Bis (2-ethyhexyl) Phthalate

The FY 2017 wet season also had eighteen (18) parameters that were not detected at either the Rio Grande North or South locations. The wet season non-detected parameters differed by two parameters as compared to the dry season; dissolved copper was detected in the wet season samples, and Total Kjedahl Nitrogen (TKN) was not detected in the wet season samples.

E. coli:

For the remaining sixteen (16) parameters on the CMC monitoring parameter list, only one parameter (E. coli) had exceedances of the applicable surface WQS found in New Mexico Administrative Code (NMAC) 20.6.4 and the Pueblo of Isleta and Pueblo of Sandia WQS during the FY 2017 dry season. At the Rio Grande North location (upstream of the Albuquerque UA, at the Angostura Diversion Dam), two (2) samples were collected and tested for E. coli, and neither of the samples had results that exceeded the primary contact-single sample Pueblo of Isleta and Pueblo of Sandia WQS (88 CFU/100 mL). At the Rio Grande South location (downstream of the MS4 UA), one (1) sample was collected and tested for E. coli, and this sample's result exceeded the primary contact-single sample NMAC WQS (410 CFU/100 ml) as well as the Pueblo of Isleta and Pueblo of Sandia WQS (88 CFU/100 mL). As a reminder, the E. coli units of MPN/100 mL and CFU/100 mL are considered to be interchangeable; the March 6, 2017 FY 2017 Wet Season Memo provides additional documentation regarding the E. coli units.

Dissolved Oxygen, PCB's and Temperature:

Three of the water quality parameters are specifically worth mentioning in this memo because they are listed in the WSB MS4 Permit, Part I.C.1 – Special Conditions: dissolved oxygen, PCBs, and temperature.

Dissolved oxygen is a water quality concern in the Rio Grande if it is below 5 mg/L. None of the samples taken from the Rio Grande during the FY 2017 CMC monitoring program had dissolved oxygen values below 5 mg/L. Refer to Figure 2 for dissolved oxygen results and comparison to applicable surface WQS.

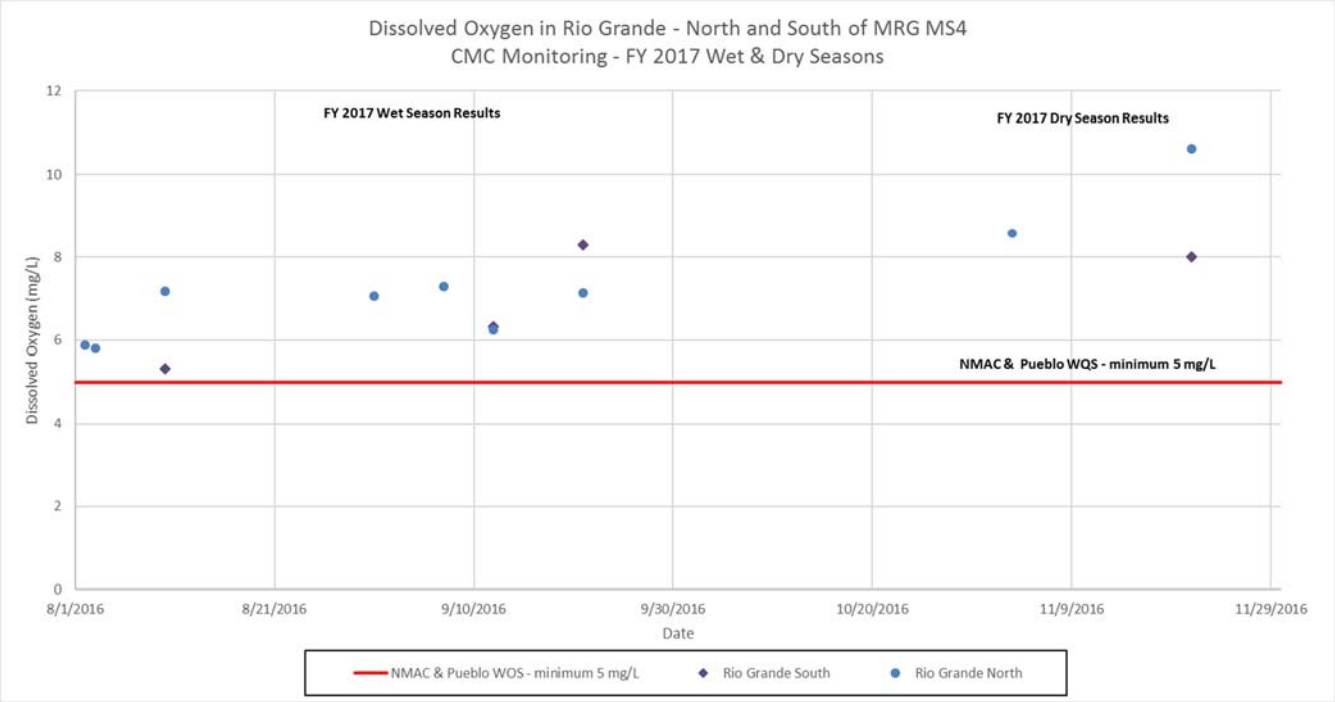


Figure 2: Dissolved Oxygen Results for Rio Grande
CMC Monitoring – FY 2017 Wet and Dry Seasons

For the CMC FY 2017 dry season sample, as well as for the three (3) FY 2017 wet season samples, there were no exceedances of WQS for PCBs.

Temperature is listed in the WSB MS4 Permit as a special condition (only applicable to the City of Albuquerque and AMAFCA). Past data submitted to EPA and NMED has proven that stormwater discharges into the Rio Grande are not impacting the Rio Grande temperature above the applicable WQS. The data collected during this FY 2017 dry season monitoring supports this conclusion. All of the temperature field readings taken in the Rio Grande during the CMC FY 2017 dry season were below 32.2°C (90 °F) – the WQS for the State of New Mexico and for the Isleta and Sandia Pueblos.

CMC FY 2017 Wet Season E. coli Loading Calculations and Waste Load Allocation (WLA)

Related to assessing the stormwater results, BHI has calculated the E. coli daily loading and compared it to the aggregate Total Maximum Daily Load (TMDL) Waste Load Allocation (WLA) for the CMC group. A TMDL is the maximum amount of a pollutant (E. coli in this case) that a water body (Rio Grande) can assimilate on a daily basis without violating applicable surface WQS. The total TMDL for a stream segment consists of the multiple WLA for point sources, non-point sources, and natural sources, plus a margin of safety. The CMC MS4 allotted WLA was determined in the US EPA Approved, Total Maximum Daily Load for the Middle Rio Grande Watershed, June 30, 2010, and subsequent communications with NMED. The WLA varies by flow condition in the Rio Grande and by stream segment.

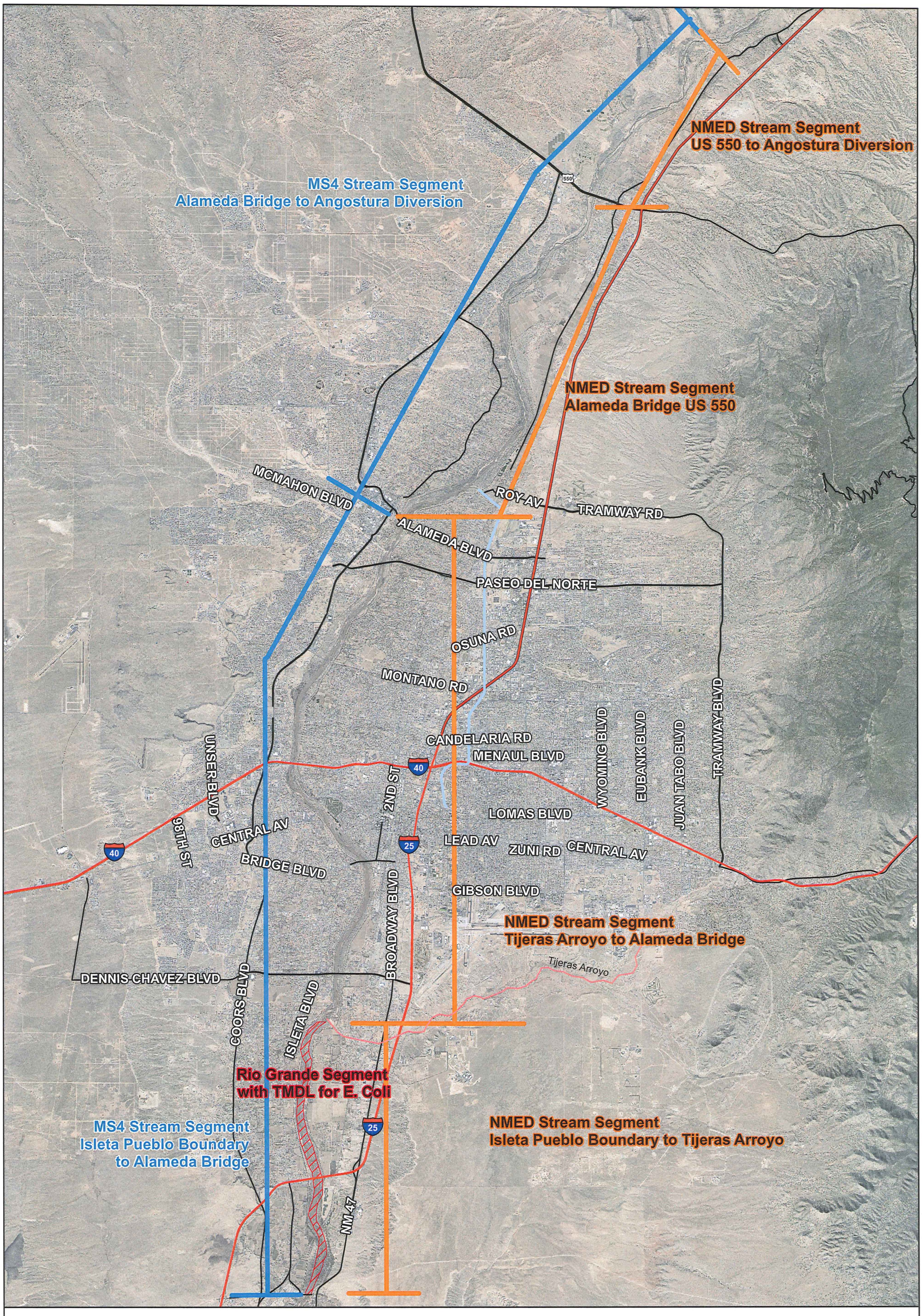
E. coli loading calculations and comparison to the WLA follows the WSB MS4 Permit requirements in “Discharges to Water Quality Impaired Water Bodies with an Approved TMDL,” Part I.C.2.b.(i).(c).B, Appendix B-Total Maximum Daily Loads (TMDLs) Tables of the WSB MS4 Permit, and the NMED guidance provided to the CMC.

Attached to this memo is the WLA Calculation spreadsheet which steps through the E. coli daily loading calculations and assumptions comparing the calculated E. coli loading to the CMC aggregate WLA defined by NMED. BHI provided the draft calculations spreadsheet for review to AMAFCA, who shared this with other CMC members, in both December 2016 and February 2017, related to the wet season monitoring results. The CMC members also met to discuss the E. coli loading calculations with NMED on February 1, 2017. BHI followed up with NMED on February 16, 2017, regarding specific calculation details. The current spreadsheet includes the improvements discussed at the NMED meeting and follow-up phone call.

There are two (2) stream segments defined in the WSB MS4 Permit (Appendix B) for the Middle Rio Grande: Isleta Pueblo Boundary to Alameda Street Bridge (Stream Segment 2105_50) and Non-Pueblo Alameda Bridge to Angostura Diversion (Stream Segment 2105.1_00). These stream segments differ from NMED’s current stream segments defined in “2016-2018 State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report,” September 23, 2016. NMED currently has four (4) stream segments instead of the two (2) WSB MS4 stream segments; of the four (4) segments, only one segment has an impairment for E. coli (2105_50 Isleta Pueblo Boundary to Tijeras Arroyo). These various stream segment designations are shown in Figure 3, page 10.

NMED provided clarification at the February 1, 2017, meeting regarding the various stream segment designations. The NMED 303(d)/305(b) 2016-2018 Integrated Report tables show the most recent assessment results, and currently there is only one segment of the Middle Rio Grande (Isleta to Tijeras) within the MS4 boundaries that was found to be impaired for E. coli. However, the TMDL for the other Middle Rio Grande stream segments do not go away even if they are no longer impaired—the TMDL remains in place as a protective measure. TMDLs remain in effect after impairments are removed as protective measures.

The E. coli daily loading associated with the CMC group and comparison to the NMED WLA was completed for the one (1) qualifying event storm event monitored in the FY 2017 dry season—November 21-22, 2016. Refer to Table 2 for a summary of the WLA comparison. A spreadsheet is attached to this memo that provides the detailed calculations for all of FY 2017.



AMAFCA

Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- MS4 Stream Segments
- NMED Stream Segments
- North Diversion Channel
- Rio Grande Segment w/ TMDL for E. Coli
- Interstate Highway
- U.S. Highway
- State Highway

N W E S

0 0.5 1 2

Miles

Figure 3
Rio Grande
NMED and MS4 Permit
Stream Segments

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Author: sganley

July 2017

Table 2: Summary of CMC Daily E. Coli Loading Compared to WLA for the CMC

Date / Stream Segment	Daily Mean Flow (cfs)	Flow Conditions (cfs) *range defined by NMED*	CMC Daily E. coli Loading (CFU/day)	NMED WLA for CMC for Stream Segment and Flow Conditions	Loading Compared to WLA Potential Exceedance or Acceptable
November 21-22, 2016 – Rio Grande North E. coli concentration = 43.5 CFU/100 mL and Rio Grande South E. coli concentration = 7,270 CFU/100 mL					
Alameda to Angostura	710	Mid	—	No Value	WLA Acceptable
Isleta to Alameda	881	Mid	1.68E+12	4.22E+10	Potential Exceedance

As Table 2 illustrates, the E. coli loading for the dry season event potentially exceeded the CMC allocated WLA in the southern stream segment (Isleta to Alameda) of the Middle Rio Grande. This sampling and calculation approach is only an estimate of the CMC contribution to the E. coli loading which is why the term “potential exceedance” is used. NMED has not set a TMDL or associated WLA values for the Alameda to Angostura stream segment of the Middle Rio Grande for mid-flow conditions (647 to 992 cfs) because there were not observed E. coli exceedances during this flow regime in the data used to develop the TMDL. Therefore, when a qualifying storm event is monitored during mid-flow regime conditions, like the November 21-21, 2016 event, in the Alameda to Angostura stream segment, the CMC’s WLA will never be in exceedance since there is not set TMDL.

The WSB MS4 Permit implies that the WLA is a measurable goal for the MS4s related to E. coli. Based on extensive review of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, this seems to be an unattainable goal for MS4s. The 2010 TMDL Report states on page 40, “It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards…Meeting the calculated TMDL may be a difficult objective.” The TMDL/WLA was calculated by NMED to meet the Pueblo (Sandia and Isleta) geometric mean maximum of 47 CFU/100 mL which was done to be “protective of downstream waters” and “to provide an implicit margin of safety (MOS).” A single grab sample E. coli result meeting this very low geometric mean WQS will be very difficult for the MS4s to obtain.

The CMC members discussed the difficulty of using the WLA as a measurable goal with NMED on February 1, 2017. NMED explained that exceeding the WLA does not trigger enforcement. However, NMED strongly encouraged the MS4s to document what they are doing once they realize the WLA is potentially exceeded. The February 1, 2017, meeting and the February 16, 2017, CMC discussion with NMED demonstrate that CMC members are working toward understanding the WLA. In addition, the CMC members and NMED discussed potential refinements to the sampling plan, demonstrating that the CMC is investigating the potential exceedances and improvements to monitor E. coli in the Rio Grande.

Data Entry for Discharge Monitoring Reports

As required in the WSB MS4 Permit, verified stormwater quality data must be submitted annually to the EPA using electronic Discharge Monitoring Report (DMR) forms. Data from the DMRs are uploaded to a comprehensive nation-wide database that contains discharge data for facilities and other point sources that discharge directly to receiving streams. Currently, the CMC members are working with the EPA regarding access and use of the NetDMR system. For this Task, BHI has not been tasked with any data entry related to the EPA DMRs for the FY 2017 wet or dry seasons.

Conclusions and Planning

In FY 2017 four (4) qualifying event samples were obtained. During the FY 2017 wet season (July 1 to October 31, 2016) three (3) qualifying stormwater samples were obtained by the CMC, and during the dry season (November 1, 2016 to June 30, 2017) one (1) qualifying stormwater sample was obtained by the CMC. Lab results have been received for these samples. This data has been entered into the project Excel database. The lab data entered is marked in the spreadsheet as “V” (verified), and data V & V has been completed.

To summarize, monitoring results and E. coli loading calculations for the CMC FY 2017 wet and dry seasons show that:

- Four (4) of the seven (7) required samples in the WSB MS4 Permit Wet Weather Monitoring section were obtained in FY 2017. Seven (7) samples are required during the 5-year Permit term, so this is significant progress for the CMC.
- The CMC has met the required Permit minimum of monitoring three (3) events during the wet season and has obtained one (1) of the two (2) events required in the dry season.
- Over half of the parameters tested were not detected in any of the Rio Grande samples.
- Only E. coli was in exceedance of applicable New Mexico and Pueblos of Sandia and Isleta WQS.
    - All dissolved oxygen results were greater than 5 mg/L (minimum WQS).
    - All temperature results were less than 32.2 °C (maximum WQS).
    - There were no PCB test results exceeding the applicable WQS.
- The calculated E. coli loading for the one (1) qualifying storm event in the dry season shows that the WLA for the CMC members is potentially exceeded for the southern stream segment (Isleta to Alameda). NMED has not set a TMDL for the Alameda to Angostura stream segment of the Middle Rio Grande for mid-flow conditions (647 to 992 cfs); therefore, the monitored dry season storm event did not exceed the WLA.
    - Sources for the E. coli loading measured in the river are not solely attributable to the CMC MS4 members; the E. coli loading calculations serve to provide a reasonable estimate of the CMC contribution to the measured E. coli loading.
    - This sampling and calculation approach is only an estimate of the CMC contribution to the E. coli loading which is why the term “potential exceedance” is used.
    - The in-stream data does not provide the concentration of E. coli contributed by only the CMC MS4s, or any of the other potential sources. By using this percentage calculation approach, if other contributors are in exceedance of the

WLA, then the CMC will likely also be in exceedance since this approach relies on a percentage of a total.

SG/le
Attachments:

Attachment 1 – Hall Environmental Analysis Laboratory Reports with BHI Notes for FY 2017 Dry Season

Attachment 2 – FY 2017 Dry Season Completed Data Verification and Validation Forms

Spreadsheets Included Separately:

E. coli Loading and Comparison to Waste Load Allocation (WLA) Excel Spreadsheet

Excel CMC Spreadsheet with FY 2017 Stormwater Quality Monitoring Results

CONSTRUCTION SITE STORMWATER RUNOFF CONTROLS			
Permit Activity	**Proposed Plan**	**Measurable Goal**	**Status**
1.1 Development of an ordinance or other regulatory mechanism as required in Part I.D.5.a.(ii)(a), The program must include the development, implementation, and enforcement of, at a minimum: (a) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal or local law;	Safety & Risk Services (SRS), Physical Plant Department (PPD) and the Office of Planning, Design & Construction (PDC) will continue to review, revise and enforce existing design and construction standards and guidelines, and develop new guidelines where appropriate. SRS Contractor requirements for new and remodeled UNM facilities requires: 1. For projects disturbing > 1 acre of soil or pavement: prior to breaking ground, contractor must make required EPA notifications (e.g., NOI and NOT) obtain an NPDES permit or waiver, and develop and comply with any required site-specific Storm Water Pollution Prevention Plan (SWPPP). SRS may request revision of contractor's SWPPP. UNM may with-hold payment for contractor non-compliance. 2. Any required storm water controls must be regularly inspected & maintained over project duration. 3. Washing out construction equipment on-site a. Permitted in PPD-approved pit locations for biodegradable and non-hazardous water-based material (e.g., latex paints, concrete) wash rinsate. Rinsate of water-based paints may also be washed down the sanitary sewers if PPD allows. b. Oil- & solvent-based materials washing rinsate must be properly disposed off-site. c. No on-site disposal of unused materials other than clean soil with PPD approval. 4. Trash Control – all exterior trash that may become wind-blown or wash off-site with storm water must be picked up at least daily. 5. As the site operator, the constructor (GC or CM, etc.) will be responsible for all EPA Construction General Permit (CGP) requirements, e.g., but not limited to meeting &	Revisions to existing policy, design or construction standards and guidelines; or creation of new policy, design or construction standards and guidelines that pertain to erosion and sediment control will be tracked and reported in the annual report.	SRS reviewed and proposed revisions to the Design Guidelines during the reporting period. The revisions are still under review.

	maintaining construction site storm water quality discharge requirements, SWPPPs, NOIs, BMPs, inspections, record-keeping, reporting, monitoring, NOTs, etc. until UNM formal acceptance of the completed project. SRS design guidelines (Rev. April 2012) require that: 1. Roof drains should direct water into plantings or be used for other beneficial reuses whenever possible before discharge to the storm sewer. 2. For projects disturbing greater than1 acre of soil or pavement, the designer shall allow space for, or design in, sufficient storm water retention to minimize discharge of sediment laden storm water during construction. For final site design, retain on-site all storm water discharge in excess of natural pre-development discharges for up to a 2-inch rain event or whatever the current CABQ Development Process Manual (DPM) requires. PPD's Environmental Services Design & Development Standard Requirements require that roof drains not drain out onto walkways and that water should be harvested if possible or roof drains directed to the storm drains.		
1.2. Develop requirements and procedures as required in Part I.D.5.a.(ii)(b) through in Part I.D.5.a.(ii)(h) (b) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices (both structural and non-structural); (c) Requirements for construction site operators to control waste such as, but not limited to, discarded building materials, concrete truck washout, chemicals,	• (See proposed activities listed for permit activity 1.1 above). • SRS and its sister departments will continue to inform UNM contractors of requirements and review necessary documents (i.e., erosion control plan, SWPP/eNOI application and fugitive dust permit) during the Construction Review Process. • SRS and its sister departments will continue to oversee UNM contractors to ensure that they comply with federal law, municipal ordinance and contractual provisions and implementing a Storm water Pollution	• Revisions to existing policy, design or construction standards and guidelines; or creation of new policy, design or construction standards and guidelines that pertain to erosion and sediment control will be tracked and reported in the annual report. • SRS and its sister departments will maintain records of	During the reporting period, SRS reviewed one SWPPP and one fugitive dust permit for the Anderson School of Management. These have been filed at SRS. During the review period, SRS identified and reviewed one site plan for opportunities for incorporating GI. Inspection checklists have been developed for inspecting construction

litter, and sanitary waste at the construction site that may cause adverse impacts to water quality (see EPA guidance at http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=117); (d) Procedures for site plan review which incorporate consideration of potential water quality impacts. The site plan review must be conducted prior to commencement of construction activities, and include a review of the site design, the planned operations at the construction site, the planned control measures during the construction phase (including the technical criteria for selection of the control measures), and the planned controls to be used to manage runoff created after the development; (e) Procedures for receipt and consideration of information submitted by the public; (f) Procedures for site inspection (during construction) and enforcement of control measures, including provisions to ensure proper construction, operation, maintenance, and repair. The procedures must clearly define who is responsible for site inspections; who has the authority to implement enforcement procedures; and the steps utilized to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and the quality of the receiving water. If a construction site operator fails to comply with procedures or policies established by the permittee, the permittee may request EPA enforcement assistance. The site inspection and enforcement procedures must describe sanctions and enforcement mechanism(s) for violations of permit requirements and penalties with detail regarding corrective action follow-up procedures, including enforcement escalation procedures for recalcitrant or	Prevention Plan (SWPPP). • PPD's Environmental Services Design & Development Standard Requirements prohibits washing of concrete trucks on site, and requires removal of construction debris, including concrete tailings from site. • SRS and its sister departments will continue to review site plans and attend pre-construction review meetings to try to ensure consistency with applicable storm water quality requirements. The plan review must occur prior to construction and focus on construction and post-construction storm water quality measures that address likely impacts and public concerns. Site plan review must include evaluation of opportunities for incorporating green infrastructure (GI). • UNM will continue to comply with the CGP, including SWPPP preparation and eNOI application for all public projects greater than one acre. • e)UNM continues to welcome public participation in its SWMP. The draft SWMP was published for public comment before submittal to the EPA. Public comments were reviewed and addressed accordingly. The SRS Department continues involving other UNM departments, e.g., PPD, PDC, etc., as stakeholders in the development and revision of UNM's SWMP. • f) UNM will continue to develop inspection procedures for exterior construction sites less than 1-acre. The new procedures will include: (1) determining who is responsible for conducting UNM construction site storm water quality inspections; determining who has authority to implement enforcement procedures regarding construction storm water quality at UNM; developing a process for prioritizing sites for inspection and enforcement based on type of construction activity; inspecting all sites greater than 1-acre at least once per	documents required from contractors pertaining to Stormwater (i.e., erosion control plan, SWPP/eNOI application and fugitive dust permit. The number of documents will be reported in the annual report. • Site plan reviews and evaluation of opportunities for incorporating green infrastructure (GI) will be documented and reported in the annual report. • Finalized inspection procedures for exterior construction sites less than 1-acre will be included the the annual report as an appendix. • SRS will maintain records of the number of trainings offered on the SWMP and general storm water pollution prevention (P2) basics, and will report these in the annual report.	sites. The inspections are conducted by SRS personnel at least once a month, and within 24 hours after a storm event. The UNM SWMPP was finalized and sent to PDC and PPD and is being implemented. Training material on stormwater management and pollution prevention was finalized and training was provided to the UNM Grounds and Lanscaping Staff. During the reporting period, two construction project sites (Anderson School of Management and Health Education Building) were inspected for stormwater management compliance. Inspection procedures for exterior construction sites less than 1-acre have been completed and are incorporated into this SWMP and included in the annual report as an appendix. During the reporting period, one training session on the SWMP and general storm water pollution prevention (P2) basics was provided and 31 staff members of the PPD grounds and landscaping attended. Training records are maintained on file at SRS.

repeat offenders. Possible sanctions include non-monetary penalties (such as stop work orders and/or permit denials for non-compliance), as well as monetary penalties such as fines and bonding requirements; (g) Procedures to educate and train permittee personnel involved in the planning, review, permitting, and/or approval of construction site plans, inspections and enforcement. Education and training shall also be provided for developers, construction site operators, contractors and supporting personnel, including requiring a stormwater pollution prevention plan for construction sites within the permitee's jurisdiction; (h) Procedures for keeping records of and tracking all regulated construction activities within the MS4, i.e. site reviews, inspections, inspection reports, warning letters and other enforcement documents. A summary of the number and frequency of site reviews, inspections (including inspector's checklist for oversight of sediment and erosion controls and proper disposal of construction wastes) and enforcement activities that are conducted annually and cumulatively during the permit term shall be included in each annual report;	year and follow up on any deficiencies to ensure corrective action; inspecting sites once project team believes final site stabilization is complete; and describing enforcement procedures and any penalties for repeated non-compliance at a UNM construction site. • The leadership of PDC & PPD will be engaged by SRS in the development and implementation of UNM's SWMP. Once the SWMP is finalized, training on the SWMP and general storm water pollution prevention (P2) basics will be offered. • UNM will continue its procedures for construction project record-keeping, including, site reviews, inspections, inspection reports, any enforcement letters & documents.		
1.3. Annually conduct site inspections of 100 percent of all construction projects cumulatively disturbing one (1) or more acres as required in Part I.D.5.a.(iii): (iii) Annually conduct site inspections of 100 percent of all construction projects cumulatively disturbing one (1) or more acres within the MS4 jurisdiction. Site inspections are to be followed by any necessary compliance or enforcement action. Follow-up inspections are to be conducted to ensure corrective maintenance has occurred; and, all projects must be inspected at completion for confirmation of final stabilization.	• UNM will continue to develop inspection procedures for 100% of all exterior construction projects cumulatively disturbing one (1) or more acres. The new procedures will include: (1) determining who is responsible for conducting UNM construction site storm water quality inspections; determining who has authority to implement enforcement procedures regarding construction storm water quality at UNM; developing a process for prioritizing sites for inspection and enforcement based on type of construction activity; inspecting all sites greater than 1-acre at least once per year and follow up on any deficiencies to ensure corrective action; inspecting sites once project team believes final site stabilization is complete; and	• Finalized inspection procedures and the number of site inspections done will be included the the annual report as an appendix.	Inspection checklists have been developed for inspecting construction sites. The inspections are conducted by SRS personnel at least once a month, and within 24 hours after a storm event. Written procedures on how the inspections should be conducted have been completed and are incorporated into this SWMP.

	describing enforcement procedures and any penalties for repeated non-compliance at a UNM construction site. The procedures will be developed and inspections begun no later that December 20, 2016.		
1.4. Coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area as required in Part I.D.5.a.(iv); (iv) The permittee must coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area to ensure that the construction stormwater runoff controls eliminate erosion and maintain sediment on site. Planning documents include, but are not limited to: comprehensive or master plans, subdivision ordinances, general land use plan, zoning code, transportation master plan, specific area plans, such as sector plan, site area plans, corridor plans, or unified development ordinances.	University of New Mexico (UNM) will continue to coordinate all UNM departments who have a role in construction activities at UNM to ensure proper controls are in place to eliminate erosion and reduce the transport of sediment from construction projects that disturb more than 1-acre on campus. • Inform UNM contractors of requirements and review necessary documents (i.e., erosion control plan, SWPP/eNOI application and fugitive dust permit) during the Construction Review Process. • SRS and its sister departments will continue to oversee UNM contractors to ensure that they comply with federal law, municipal ordinance and contractual provisions and implementing a Storm water Pollution Prevention Plan (SWPPP). • SRS and its sister departments will continue to review site plans and attend pre-construction review meetings to try to ensure consistency with applicable storm water quality requirements. The plan review must occur prior to construction and focus on construction and post-construction storm water quality measures that address likely impacts and public concerns. Site plan review must include evaluation of opportunities for incorporating green infrastructure (GI).	UNM will include a summary of regulated construction activities in the Annual Report.	During the reporting period, SRS reviewed project planning and design documents and participated in regular construction project meetings that included construction companies, the Physical Plant (PPD), Planning, Design and Construction (PDC), Parking and Transportation Services (PATS) and other UNM departments. SRS provided input to ensure proper controls are in place to eliminate erosion and reduce the transport of sediment from construction project sites. Examples of projects included an addition to the Anderson School of Management, the new Physics, Astronomy and Interdisciplinary Science building and the Health Science Education Building.
1.5. Evaluation of GI/LID/Sustainable practices in site plan reviews as required in Part I.D.5.a.(v): (v) The site plan review required in Part I.D.5.a.(ii)(d) must include an evaluation of opportunities for use of GI/LID/Sustainable practices and when the opportunity exists, encourage project proponents to incorporate such practices into the site design to mimic the pre-development hydrology of the previously undeveloped site. For purposes of this permit, pre-development hydrology shall be met according to Part I.D.5.b of this permit. (consistent with any limitations	• SRS and its sister departments will continue to review site plans and attend pre-construction review meetings to try to ensure consistency with applicable storm water quality requirements. The plan review must occur prior to construction and focus on construction and post-construction storm water quality measures that address likely impacts and public concerns. Site plan review must include evaluation of opportunities for incorporating green infrastructure (GI).	SRS will include in the Annual Report the number of opportunities to incorporate GI and the number of times GI has actually been incorporated	During the reporting period, SRS reviewed one construction project (Smith Plaza) site plans for opportunities to incorporate GI. This project, which is still in design phase, will reduce the amount of impervious surface area in the UNM Smith Plaza.

on that capture). Include a reporting requirement of the number of plans that had opportunities to implement these practices and how many incorporated these practices.			
1.6. Enhance the program to include program elements in Part I.D.5.a.(viii) through Part I.D.5.a.(x): (viii) The permittee may use storm water educational materials locally developed or provided by the EPA (refer to http://water.epa.gov/polwaste/npdes/swbmp/index.cfm , http://www.epa.gov/smartgrowth/parking.htm, http://www.epa.gov/smartgrowth/stormwater.htm), the NMED, environmental, public interest or trade organizations, and/or other MS4s. (ix) The permittee may develop or update existing construction handbooks (e.g., the COA NPDES Stormwater Management Guidelines for Construction and Industrial Activities Handbook) to be consistent with promulgated construction and development effluent limitation guidelines. (x) The construction site inspections required in Part I.D.5.a.(iii) may be carried out in conjunction with the permittee's building code inspections using a screening prioritization process.	• UNM will utilize its own, or when appropriate, publicly available stormwater educational material to enhance its stormwater program. • Where applicable, UNM will refer to existing local, state and federal construction handbooks and stormwater management guidelines to ensure consistency and compliance with promulgated construction and development effluent limitation guidelines.	SRS participated in the revision/update of the local "NPDES Storm Water Management Guideline for Construction and Industrial Activities Handbook". It is now completed. UNM will include an update in its annual report.	During the reporting period, UNM used stormwater educational materials provided by the EPA to enhance its stormwater education training and outreach material. Copies of UNM's education training and outreach material are available upon request.
1.7. Describe other proposed activities to address the Construction Site Stormwater Runoff Control Measure:	• No additional activities are being proposed at this time. UNM will continue to explore additional activities to address the Construction Site Stormwater Runoff Control Measure.	Additional proposed activities will be reported in the annual report.	
POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND RE-DEVLEOPMENT			
Permit Activity	**Proposed Plan**	**Measurable Goal**	
2.1. Development of strategies as required in Part I.D.5.b.(ii).(a): (ii) The program must include the development,	• SRS will work with its sister departments (e.g. PPD, PDC and Parking and Transportation Services) to propose design review and construction procedures to	• Submit draft policies, procedures, guidelines, protocols regarding Storm	The SRS Design guidelines state that for projects disturbing greater than1 acre of soil or pavement, the designer shall allow space for, or

implementation, and enforcement of, at a minimum: (a) Strategies which include a combination of structural and/or non-structural best management practices (BMPs) to control pollutants in stormwater runoff.	assure that structural and/or non-structural best management practices (BMPs) to control pollutants in stormwater runoff are incorporated into all new development and re-development for projects disturbing more than 1-acre or for projects disturbing less than 1-acre that are part of a greater than one acre common plan for development of the campus. • SRS will propose the development of contractual procedures to ensure implementation of UNM's SWMP in UNM development and redevelopment projects. • By February 20 2016, SRS will work to develop and adopt design standards, including methodology, to estimate water quality impacts and selection of controls.	Water Quality upon completion. • Provide discussion of education and outreach activities geared toward LID implementation in the Annual Report. • Submission of cumulative changes in UNM's Storm Water Management Program in the Annual Report.	design in, sufficient storm water retention to minimize discharge of sediment laden storm water during construction. For final site design, retain on-site all storm water discharge in excess of natural pre-development discharges for up to a 2-inch rain event or whatever the current CABQ Development Process Manual (DPM) requires. UNM will adopt and implement applicable guidance from the April 2002 EPA Manual, *Urban Stormwater BMP Performance Monitoring*, on how to estimate water quality impacts of BMPs, when feasible.
2.2. Development of an ordinance or other regulatory mechanism as required in Part I.D.5.b.(ii).(b): (b) An ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law. The ordinance or policy must: Incorporate a stormwater quality design standard that manages on-site the 90th percentile storm event discharge volume associated with new development sites and 80th percentile storm event discharge volume associated with redevelopment sites, through stormwater controls that infiltrate, evapotranspire the discharge volume, except in instances where full compliance cannot be achieved, as provided in Part I.D.5.b.(v). The stormwater from rooftop discharge may be harvested and used on-site for non-commercial use. Any controls utilizing impoundments	• SRS will work with its sister departments (PPD, PDC and Parking and Transportation Services etc.) to develop and adopt design standards, policy and enforcement mechanisms for requiring on-site management of 90th percentile (0.44-inch) storm events discharge volume associated with new development sites and 80th percentile storm event discharge volume associated with redevelopment sites, by December 20 2017.	• Submission of finalized policies, procedures, guidelines, protocols regarding Storm Water Quality upon completion of finalized draft.	The SRS Design guidelines refer to the City of Albuquerque Development Process Manual specifications for stormwater discharge from construction sites.

that are also used for flood control that are located in areas where the New Mexico Office of the State Engineer requirements at NMAC 19.26.2.15 (see also Section 72-5-32 NMSA) apply must drain within 96 hours unless the state engineer has issued a waiver to the owner of the impoundment. Options to implement the site design standard include, but not limited to: management of the discharge volume achieved by canopy interception, soil amendments, rainfall harvesting, rain tanks and cisterns, engineered infiltration, extended filtration, dry swales, bioretention, roof top disconnections, permeable pavement, porous concrete, permeable pavers, reforestation, grass channels, green roofs and other appropriate techniques, and any combination of these practices, including implementation of other stormwater controls used to reduce pollutants in stormwater (e.g., a water quality facility). Estimation of the 90th or 80th percentile storm event discharge volume is included in EPA Technical Report entitled "Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, New Mexico, EPA Publication Number 832-R-14-007". Permittees can also estimate: Option A: a site specific 90th or 80th percentile storm event discharge volume using methodology specified in the referenced EPA Technical Report. Option B: a site specific pre-development hydrology and associated storm event discharge volume using methodology specified in the referenced EPA technical Report.			
2.3. Implementation and enforcement, via the ordinance or other regulatory mechanism, of site design standards as required in Part I.D.5.b.(ii).(b).	• SRS will work with its sister departments to develop and implement monitoring and enforcement mechanisms of UNM design standards and guidelines by December 20, 2018.		This is ongoing and has a target completion date of December 20, 2018.
2.4. Ensure appropriate implementation of	• Once developed, the post construction program	• In each annual report to	UNM's post construction activities

structural controls as required in Part I.D.5.b.(ii).(c) and Part I.D.5.b.(ii).(d): (d) The permittee must ensure that the post-construction program requirements are constantly reviewed and revised as appropriate to incorporate improvements in control techniques;	requirements will be monitored, reviewed and revised as appropriate by SRS, with input from other departments, on an annual basis. A process will be put in place by June 20, 2017.	EPA, SRS will report any changes/revisions to UNM's Post-Construction Program.	are outlined in UNM's Stormwater Operations and Maintenance plan. The plan was developed in 2017, and is available upon request. Revisions to the plan will be noted in future annual reports.
2.5. Develop procedures as required in Part I.D.5.b.(ii).(e), Part I.D.5.b.(ii).(f), Part I.D.5.b.(ii).(g), and Part I.D.5.b.(ii).(h): (e) Procedure to develop and implement an educational program for project developers regarding designs to control water quality effects from stormwater, and a training program for plan review staff regarding stormwater standards, site design techniques and controls, including training regarding GI/LID/Sustainability practices. Training may be developed independently or obtained from outside resources, i.e. federal, state, or local experts; (f) Procedures for site inspection and enforcement to ensure proper long-term operation, maintenance, and repair of stormwater management practices that are put into place as part of construction projects/activities. Procedure(s) shall include the requirement that as-built plans be submitted within ninety (90) days of completion of construction projects/activities that include controls designed to manage the stormwater associated with the completed site (post-construction stormwater management). Procedure(s) may include the use of dedicated funds or escrow accounts for development projects or the adoption by the permittee of all privately owned control measures. This may also include the development of maintenance contracts between the owner of the control measure and the permittee. The maintenance contract shall include verification of maintenance practices by the owner, allows the MS4 owner/operator to inspect the	• SRS will participate and cooperate in local experts' combined efforts to refine and present storm water quality educational training for project developers. UNM staff (e.g., PDC, PPD, etc.), including plan reviewers, on construction project teams will receive such training. • SRS in conjunction with PPD will inspect campus storm water management and control systems to assure long-term operation, maintenance and repair of storm water management and control systems. SRS will propose policy that requires that construction project teams submit as-built plans for storm water management and control systems within 90 days of construction completion. The number of such inspections will be mentioned in UNM's Annual Reports to EPA. This will be completed by June 20, 2016. • UNM's Integrated Pest Management (IPM) manual applies to UNM campus wide. PPD will review and revise the IPM, provide more IPM related training to employees, seek less toxic and equally less expensive new approaches. SRS will work with PPD to review their protocols for applying herbicides and fertilizers and will work to monitor the use of pesticides, herbicides, and fertilizers.	• Provide discussion of education and outreach activities geared toward LID implementation in the Annual Report. • Discussion of maintenance and inspections of storm water control features in Annual Report.	The physical plant inspected and is replacing the grates on stormwater inlets with smaller sized grates to allow trapping of smaller size sediment. UNM has replaced about 25 grates to date. SRS has developed inspection checklists used to inspect campus storm water management and control systems to assure long-term operation, maintenance and repair of storm water management and control systems. During this reporting period, SRS conducted three (3) inspections: the retention ponds north west of the basketball arena, detention ponds behind Domenici Hall and the swales located north of the G parking lot. UNM Golf Course contractors and PPD Grounds and landscaping staff engaged in IPM activities are required to maintain licenses. As part of the licensing process, they receive annual training on IPM. They are also required by the New Mexico Department of Agriculture to maintain detailed logs of herbicide and fertilizer application.

maintenance practices, and perform maintenance if inspections indicate neglect by the owner; (g) Procedures to control the discharge of pollutants related to commercial application and distribution of pesticides, herbicides, and fertilizers where permittee(s) hold jurisdiction over lands not directly owned by that entity (e.g., incorporated city). The procedures must ensure that herbicides and pesticides applicators doing business within the permittee's jurisdiction have been properly trained and certified, are encouraged to use the least toxic products, and control use and application rates according to the applicable requirements; and (h) Procedure or system to review and update, as necessary, the existing program to ensure that stormwater controls or management practices for new development and redevelopment projects/activities continue to meet the requirements and objectives of the permit.			
2.6. Coordinate internally with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area as required in Part I.D.5.b.(iii) (iii) The permittee must coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private new development and redevelopment projects/activities within the permit area to ensure the hydrology associated with new development and redevelopment sites mimic to the extent practicable the pre-development hydrology of the previously undeveloped site, except in instances where the pre-development hydrology requirement conflicts with applicable water rights appropriation requirements. For purposes of this permit, pre-development	• SRS will work with its sister departments (PPD, PDC and Parking and Transportation Services etc) to develop and adopt design standards, policy and enforcement mechanisms for requiring on-site management of 90th percentile (0.44-inch) storm events discharge volume associated with new development sites and 80th percentile storm event discharge volume associated with redevelopment sites. This will be done by December 2015.	• A discussion on UNM's progress in developing and adopting such design standards, policy and enforcement mechanisms will be included in the annual report.	The SRS Design guidelines refer to the City of Albuquerque Development Process Manual specifications for stormwater discharge from construction sites.

hydrology shall be met by capturing the 90th percentile storm event runoff (consistent with any limitations on that capture) which under undeveloped natural conditions would be expected to infiltrate or evapotranspirate on-site and result in little, if any, off-site runoff. (Note: This permit does not prevent permittees from requiring additional controls for flood control purposes.) Planning documents include, but are not limited to: comprehensive or master plans, subdivision ordinances, general land use plan, zoning code, transportation master plan, specific area plans, such as sector plan, site area plans, corridor plans, or unified development ordinances.			
2.7. As required in Part I.D.5.b.(iv), the permittee must assess all existing codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices: (iv) The permittee must assess all existing codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices. The assessment shall include a list of the identified impediments, necessary regulation changes, and recommendations and proposed schedules to incorporate policies and standards to relevant documents and procedures to maximize infiltration, recharge, water harvesting, habitat improvement, and hydrological management of stormwater runoff as allowed under the applicable water rights appropriation requirements. The permittee must develop a report of the assessment findings, which is to be used to provide information to the permittee, of the regulation changes necessary to remove impediments and allow implementation of these practices.	• SRS will work with PDC, PPD and other departments to assess facility planning and design procedures to identify impediments for the incorporation of GI/LID approaches including infiltration, recharge, water harvesting, habitat improvement and/or hydrological management to improve post-construction storm water quality. This will be completed by June 22, 2016.	• An update will provided in the annual report.	SRS reviewed UNM's master plan documents and identified three main impediments to implementing GI/LID. Inadequate funding for new or remodel projects, lack of awareness.
2.8. As required in Part I.D.5.b.(iv), describe the plan to report the assessment findings on GI/LID/Sustainable practices	• Assessment findings will be tracked, recorded and reported in an annual report by March 20, 2017.		
2.9. Estimation of the number of acres of IA and DCIA as required in Part I.D.5.b.(vi):	• By June 20, 2017, SRS will calculate and update an estimate		This process has been completed. There are 576.3 acres of

(vi) The permittee must estimate the number of acres of impervious area (IA) and directly connected impervious area (DCIA). For the purpose of his part, IA includes conventional pavements, sidewalks, driveways, roadways, parking lots, and rooftops. DCIA is the portion of IA with a direct hydraulic connection to the permittee's MS4 or a waterbody via continuous paved surfaces, gutters, pipes, and other impervious features. DCIA typically does not include isolated impervious areas with an indirect hydraulic connection to the MS4 (e.g., swale or detention basin) or that otherwise drain to a pervious area.	of acreage of impervious areas (IA) and directly connected impervious areas (DCIA). UNM may report the acreages of IA and DCIA in a tabular format to EPA and describe the methodology used to calculate the acreages.	• Estimation of campus IAs and DCIA removed or added in the Annual Report.	impervious area and 681.7 acres of permeable area at UNM. The majority of UNM's impervious area has a direct hydraulic connection to the MS4, and can therefore be considered DCIA. The assessment report is available upon request.
2.10. Inventory and priority ranking as required in section in Part I.D.5.b.(vii): (vii) The permittee must develop an inventory and priority ranking of MS4-owned property and infrastructure (including public right-of-way) that may have the potential to be retrofitted with control measures designed to control the frequency, volume, and peak intensity of stormwater discharges to and from its MS4. In determining the potential for retrofitting, the permittee shall consider factors such as the complexity and cost of implementation, public safety, access for maintenance purposes, subsurface geology, depth to water table, proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems, and opportunities for public use and education under the applicable water right requirements and restrictions. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service and control of discharges to impaired waters, streams, and critical receiving water (drinking water supply sources);	• By June 20, 2018, SRS will complete an inventory and rank campus property and MS4 infrastructure that may have the potential to be retrofitted with control measures to improve storm water quality. Factors such as implementation cost, public safety, maintenance access, geology, depth to groundwater/aquifer, proximity to other infrastructure (e.g., sanitary sewer & septic systems), opportunities for public use and education should be considered in the priority ranking of potential retrofit projects.	• An annual report on what retrofitting work has been done will be made beginning in the 2017 Annual Report to the EPA, and such reporting will continue in each subsequent Annual Report to the EPA.	This process in ongoing. Target completion is June 20, 2018.
2.11. Incorporate watershed protection elements as required in Part I.D.5.b.(viii):	By June 20, 2017 SRS will work to research and develop	• All new proposed watershed protection	UNM has identified watershed protection measures. However, no

(viii) The permittee must incorporate watershed protection elements into relevant policy and/or planning documents as they come up for regular review. If a relevant planning document is not scheduled for review during the term of this permit, the permittee must identify the elements that cannot be implemented until that document is revised, and provide to EPA and NMED a schedule for incorporation and implementation not to exceed five years from the effective date of this permit. As applicable to each permittee's MS4 jurisdiction, policy and/or planning documents must include the following: (a) A description of master planning and project planning procedures to control the discharge of pollutants to and from the MS4. (b) Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within each watershed, by controlling the unnecessary creation, extension and widening of impervious parking lots, roads and associated development. The permittee may evaluate the need to add impervious surface on a case-by- case basis and seek to identify alternatives that will meet the need without creating the impervious surface. (c) Identify environmentally and ecologically sensitive areas that provide water quality benefits and serve critical watershed functions within the MS4 and ensure requirements to preserve, protect, create and/or restore these areas are developed and implemented during the plan and design phases of projects in these identified areas. These areas may include, but are not limited to critical watersheds, floodplains, and areas with endangered species concerns and historic properties. Stakeholders shall be consulted as appropriate. (d) Implement stormwater management practices that	watershed protection measures and propose their incorporation into UNM policy and planning documents as they come up for review for renewal. Such policy and planning documents will include: • A description of UNM's master planning and project planning procedures to control the discharge of pollutants into the MS4. • Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within the campus by controlling the creation and expansion of such during development and re-development. • Identify any environmentally or ecologically sensitive areas that provides water quality benefits or serve critical watershed functions. Requirements may be needed to protect such if there is a technical basis to justify the actual existence of any such areas on campus. Inviting stakeholder input may be required for identifying sensitive areas. • No streams exist on campus. Should UNM acquire and develop stream-side property, then measures will be taken to disconnect direct discharge to the stream from impervious areas. • UNM will seek to avoid hydro-modification of arroyos caused by campus development, including roads, etc. • UNM will develop and implement development policies to protect soils, prevent topsoil stripping and soil compaction. • UNM will continue to incorporate watershed protection elements into relevant policy and/or planning documents as they come up for regular review.	measures will be discussed in the annual report.	UNM policy and planning documents came up for review and renewal during the reporting period.

minimize water quality impacts to streams, including disconnecting direct discharges to surface waters from impervious surfaces such as parking lots. (e) Implement stormwater management practices that protect and enhance groundwater recharge as allowed under the applicable water rights laws. (f) Seek to avoid or prevent hydromodification of streams and other water bodies caused by development, including roads, highways, and bridges. (g) Develop and implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils. (h) The program must be specifically tailored to address local community needs (e.g. protection to drinking water sources, reduction of water quality impacts) and must be designed to attempt to maintain pre-development runoff conditions.			
2.12. Enhance the program to include program elements in Part I.D.5.b.(xi) and Part I.D.5.b.(xii): (xii) When choosing appropriate BMPs, the permittee may participate in locally-based watershed planning efforts, which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, the permittee may adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures.	• UNM will continue to participate in locally-based watershed planning efforts, such as the stormwater Technical Advisory Group (TAG) and the Middle Rio Grande Urban Waters Partnership and work to incorporate ideas from these efforts into its Stormwater management program.		During the reporting period, UNM participated in TAG meeting and discussions with the Middle Rio Grande Urban Waters Partnership.
2.13. Describe other proposed activities to address the Post-Construction Stormwater Management in New Development and Redevelopment Measure:	• No additional activities are being proposed at this time. UNM will continue to explore additional activities to address the Post Construction Stormwater Management in New Development and Redevelopment Measure.	Additional proposed activities will be reported in the annual report.	

POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

Permit Activity	Proposed Plan	Measurable Goal	Status
3.1. Develop or update the Pollution Prevention/Good House Keeping program to include the elements in Part I.D.5.c.(i): (i) The permittee must develop, revise and implement an operation and maintenance program that includes a training component and the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The program must include: (a) Development and implementation of an employee training program to incorporate pollution prevention and good housekeeping techniques into everyday operations and maintenance activities. The employee training program must be designed to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. The permittee must also develop a tracking procedure and ensure that employee turnover is considered when determining frequency of training; (b) Maintenance activities, maintenance schedules, and long term inspections procedures for structural and non-structural storm water controls to reduce floatable, trash, and other pollutants discharged from the MS4. (c) Controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand	• UNM will continue to implement, review and enhance pollution prevention practices. When possible, UNM will implement new source control procedures to limit the discharge of pollutants from the campus MS4. • As required, PPD will implement a) Storm Water Operations & Maintenance (O&M) Program b) grounds and landscaping maintenance; c) road and parking lot operation and maintenance; d) fleet and building maintenance; e) new construction and land disturbance training; f) utility systems maintenance; g) MS4 system maintenance. • The UNM O&M program will include training for appropriate UNM staff on improving storm water quality. SRS will include storm water education in the New Employee Orientation and Basic Annual Safety Training that all UNM employees are required to take. • PPD's O&M Program maintains: a) an updated list of storm water quality facilities by drainage basin, including location and description; b) a target number of 20 storm water quality facilities will be inspected once every 3 months by PPD and cleaned if necessary (See Table 1); and c) continue PPD's leading source control program of street and hard-scaping sweep and daily (M-F) litter pickup on campus. • UNM maintains a Spill Prevention, Countermeasure and Control Plan (SPCCP) to address the risks from oil tanks larger than 55 gallons. UNM takes measures to insure that parties responsible for a spill on campus take reasonable steps to control and minimize threats to human	• Submission of annual progress included in Annual Report.	Stormwater Management training was provided to UNM Grounds and Landscaping personnel. UNM updated and implemented its SPCC Plan during the reporting period. UNM has prepared a written Stormwater Operation and maintenance manual that includes the required elements listed.

storage locations, snow disposal areas operated by the permittee, and waste transfer stations; (d) Procedures for properly disposing of waste removed from the separate storm sewers and areas listed in Part I.D.5.c.(i).(c) (such as dredge spoil, accumulated sediments, floatables, and other debris); and (e) Procedures to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices. Note: The permittee may use training materials that are available from EPA, NMED, Tribe, or other organizations.	health and the environment. • Potential discharges will be controlled through implementation of spill prevention practices, self-inspections, and employee training. PPD's O&M Program will also include measures to control the following storm water pollutants: a) de-icing salts; b) roadway debris and roadside vegetation management practices; leaked automotive fluids in equipment maintenance yards; c) debris on hard-scaping (roads, etc.) that can be reduced by modifying street sweeping strategies; and d) targeting problem areas on campus that may have greater pollution potential.		
3.2. Enhance the program to include the elements in Part I.D.5.c.(ii): (ii) The Pollution Prevention/Good Housekeeping program must include the following elements: (a) Develop or update the existing list of all stormwater quality facilities by drainage basin, including location and description; (b) Develop or modify existing operational manual for de-icing activities addressing alternate materials and methods to control impacts to stormwater quality; (c) Develop or modify existing program to control pollution in stormwater runoff from equipment and vehicle maintenance yards and maintenance center operations located within the MS4; (d) Develop or modify existing street sweeping program. Assess possible benefits from changing frequency or timing of sweeping activities or utilizing different equipment for sweeping activities; (e) A description of procedures used by permittees to	(See Proposed Plan for Permit Activities listed in 3.1 above). In addition, UNM will do the following: • UNM's O&M program will identify waste disposal standard operating procedures (SOPs), including SOPs for motor vehicle fluids, toxic paints, solvents, fertilizers, pesticides, herbicides and any other hazmat, by June 2017. This will include a list of opportunities for recycling substances. Also, standard operating procedures will address the removal of sediments, debris, floatables and litter including pet wastes. • By June 20, 2017, UNM will re-assess existing flood control infrastructure for the potential to retro-fit it with additional water quality enhancement features. • UNM's O&M Program maintains: a) an updated list of storm water quality facilities by drainage basin, including location and description; b) a target number of 20 storm water quality facilities shall be inspected once every 3 months by PPD and cleaned if necessary	• Submission of annual progress updates in Annual Report.	PPD continued routine O&M operations for street sweeping, trash collections, recycling. Disposal of hazardous chemicals and used oils from maintenance shops were done through SRS or other third party vendors. UNM does not have flood control infrastructure.

target roadway areas most likely to contribute pollutants to and from the MS4 (i.e., runoff discharges directly to sensitive receiving water, roadway receives majority of de-icing material, roadway receives excess litter, roadway receives greater loads of oil and grease); (f) Develop or revise existing standard operating procedures for collection of used motor vehicle fluids (at a minimum oil and antifreeze) and toxics (including paint, solvents, fertilizers, pesticides, herbicides, and other hazardous materials) used in permittee operations or discarded in the MS4, for recycle, reuse, or proper disposal; (g) Develop or revised existing standard operating procedures for the disposal of accumulated sediments, floatables, and other debris collected from the MS4 and during permittee operations to ensure proper disposal; (h) Develop or revised existing litter source control programs to include public awareness campaigns targeting the permittee audience; and (i) Develop or review and revise, as necessary, the criteria, procedures and schedule to evaluate existing flood control devices, structures and drainage ways to assess the potential of retrofitting to provide additional pollutant removal from stormwater. Implement routine review to ensure new and/or innovative practices are implemented where applicable. (j) Enhance inspection and maintenance programs by coordinating with maintenance personnel to ensure that a target number of structures per basin are inspected and maintained per quarter; (k) Enhance the existing program to control the discharge of floatables and trash from the MS4 by implementing source control of floatables in industrial and commercial areas;			

(l) Include in each annual report, a cumulative summary of retrofit evaluations conducted during the permit term on existing flood control devices, structures and drainage ways to benefit water quality. Update the SWMP to include a schedule (with priorities) for identified retrofit projects; (m) Flood management projects: review and revise, as necessary, technical criteria guidance documents and program for the assessment of water quality impacts and incorporation of water quality controls into future flood control projects. The criteria guidance document must include the following elements: A. Describe how new flood control projects are assessed for water quality impacts. B. Provide citations and descriptions of design standards that ensure water quality controls are incorporated in future flood control projects. C. Include method for permittees to update standards with new and/or innovative practices. D. Describe master planning and project planning procedures and design review procedures. (n) Develop procedures to control the discharge of pollutants related to the storage and application of pesticides, herbicides, and fertilizers applied, by the permittee's employees or contractors, to public right-of-ways, parks, and other municipal property. The permittee must provide an updated description of the data monitoring system for all permittee departments utilizing pesticides, herbicides and fertilizers.			
3.3. Develop or update a list and a map of industrial facilities owned or operated by the permittee as required in Part I.D.5.c.(iii): (iii) Comply with the requirements included in the EPA Multi Sector General Permit (MSGP) to control runoff	• UNM does not have operations within our campus jurisdiction that would normally be categorized as industrial or that have the potential for high risk runoff.	• UNM will submit a certification to EPA to that effect.	

from industrial facilities (as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi)) owned or operated by the permittees and ultimately discharge to the MS4. The permittees must develop or update: (a) A list of municipal/permittee operations impacted by this program, (b) A map showing the industrial facilities owned and operated by the MS4, (c) A list of the industrial facilities (other than large construction activities defined as industrial activity) that will be included in the industrial runoff control program by category and by basin. The list must include the permit authorization number or a MSGP NOI ID for each facility as applicable.			
3.4. Describe other proposed activities to address the Pollution Prevention/Good Housekeeping for Municipal/permittee Operations Measure:	• No additional activities are being proposed at this time. UNM will continue to explore additional activities to address the Pollution Prevention/Good Housekeeping for Municipal/permittee Operations Measure.	• Additional proposed activities will be reported in the annual report.	•

INDUSTRIAL AND HIGH RISK RUNOFF

Permit Activity	Proposed Plan	Measurable Goal
4.1. Ordinance (or other control method) as required in Part I.D.5.d.(i): (i) The permittee must control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi). If no such industrial activities are in a permittees jurisdiction, that permittee may certify that this program element does not apply.	• UNM does not have operations within our campus jurisdiction that would normally be categorized as industrial or that have the potential for high risk runoff.	• UNM will submit a certification to EPA to that effect.
4.2. Continue implementation and enforcement of the Industrial and High Risk Runoff program, assess the overall success of the program, and document both direct and indirect measurements of program effectiveness in the annual report as required in Part I.D.5.d.(ii): (ii) The permittee must continue implementation and enforcement of the Industrial and High Risk Runoff program, assess the overall success of the program, and document both direct and indirect measurements of program effectiveness in the annual report. The program shall include: (a) A description of a program to identify, monitor, and control pollutants in stormwater discharges to the MS4 from municipal landfills; other treatment, storage, or disposal facilities for municipal waste (e.g. transfer stations, incinerators, etc.); hazardous waste treatment, storage, disposal and recovery facilities; facilities that are subject to EPCRA Title III, Section 313; and any other industrial or commercial discharge the permittee(s) determines are contributing a substantial pollutant loading to the MS4. (Note: If no such facilities are in a permittees jurisdiction, that permittee may certify that this program element does not apply.); and		

(b) Priorities and procedures for inspections and establishing and implementing control measures for such discharges.		
4.3. Meet the monitoring requirements in Part I.D.5.d.(iii): (iii) Permittees must comply with the monitoring requirements specified in Part III.A.4;		
4.4. Include requirements in Part I.D.5.d.(iv): (iv) The permittee must modify the following as necessary: (a) The list of the facilities included in the program, by category and basin; (b) Schedules and frequency of inspection for listed facilities. Facility inspections may be carried out in conjunction with other municipal programs (e.g. pretreatment inspections of industrial users, health inspections, fire inspections, etc.), but must include random inspections for facilities not normally visited by the municipality; (c) The priorities for inspections and procedures used during inspections (e.g. inspection checklist, review for NPDES permit coverage; review of stormwater pollution prevention plan; etc.); and (d) Monitoring frequency, parameters and entity performing monitoring and analyses (MS4 permittees or subject facility). The monitoring program may include a waiver of monitoring for parameters at individual facilities based on a "no-exposure" certification;		
4.5. Enhance the program to include requirements in Part I.D.5.d.(vii): (vii) The permittee may: (a) Use analytical monitoring data, on a parameter-by-parameter basis, that a facility has collected to comply with or apply for a State or NPDES discharge permit (other than this permit), so as to avoid unnecessary cost and duplication of effort; (b) Allow the facility to test only one (1) outfall and to report that the quantitative data also apply to the substantially identical outfalls if:		

A. A Type 1 or Type 2 industrial facility has two (2) or more outfalls with substantially identical effluents, and B. Demonstration by the facility that the stormwater outfalls are substantially identical, using one (1) or all of the following methods for such demonstration. The NPDES Stormwater Sampling Guidance Document (EPA 833-B-92-001), available on EPA's website at provides detailed guidance on each of the three options: (1) submission of a narrative description and a site map; (2) submission of matrices; or (3) submission of model matrices. (c) Accept a copy of a "no exposure" certification from a facility made to EPA under 40 CFR §122.26(g), in lieu of analytic monitoring.		
4.6. Describe other proposed activities to address the Industrial and High Risk Runoff Measure:		

ILLICIT DISCHARGES AND IMPROPER DISPOSAL

Permit Activity	Proposed Plan	Measurable Goal	Status
5.1. Mapping as required in Part I.D.5.e.(i)(a); (i) The permittee shall develop, revise, implement, and enforce a program to detect and eliminate illicit discharges (as defined at 40 CFR 122.26(b)(2)) entering the MS4. Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The permittee must: (a) Develop, if not already completed, a storm sewer system map, showing the names and locations of all outfalls as well as the names and locations of all waters of the United States that receive discharges from those outfalls. Identify all discharges points into major drainage channels draining more than twenty (20) percent of the MS4 area;	(see Proposed Plan listed for permit Acitivity 5.2 below) • UNM completed a campus utility map in 2013 which includes its storm sever map. UNM will continue to revise and update its storm sewer system map as necessary..	• Updates to the map will be reported in the annual report. .	UNM continued to implement its activities to detect and eliminate illicit discharges, and also revised its written IDDE plan. UNM does not have what would be considered outfalls as defined in Part VII of the permit. UNM has identified discharge points into major drainage channels.
5.2. Ordinance (or other control method) as required in Part I.D.5.e.(i)(b): (b) To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into the MS4, and implement appropriate enforcement procedures and actions;	• To the extent possible, SRS will work with other departments to develop mechanisms to control, non-stormwater discharges into the MS4, and implement appropriate enforcement procedures and actions by June 2017.		UNM's Construction Safety Manual and the SRS design guidelines and contractor requirements prohibit non-stormwater discharges into the MS4. UNM has implemented an IDDE program which regulates non-stormwater discharges into the MS4
5.3. Develop and implement a IDDE plan as required in Part I.D.5.e.(i)(c): (c) Develop and implement a plan to detect and address non-stormwater discharges, including illegal dumpling, to the MS4. The permittee must include the following elements in the plan: A. Procedures for locating priority areas likely to have illicit discharges including field test for selected pollutant indicators (ammonia, boron, chlorine, color, conductivity, detergents, E. coli, enterococci, total coliform, fluoride, hardness, pH, potassium, conductivity, surfactants), and visually screening outfalls during dry weather;	• UNM continues to implement efforts to detect and eliminate illicit discharges and improper disposal that may impact the quality of storm water discharged from the campus. IDDE efforts at UNM have historically identified and eliminated at least one non-storm water discharge to our MS4. SRS Department investigates IDDE problems within 48-hours of being reported. UNM then eliminates illicit discharges or improper disposal on campus within 30 days. If more time is needed then SRS Department develops an elimination schedule within six months.	• SRS will implement an IDDE program on a third of UNM's MS4 system by 4/1/16 and 100% of the UNM MS4 by 6/20/2017. • If the systematic IDDE process identifies a significant illicit discharge or improper disposal on campus, then that finding and a brief explanation of any potential hazard will be posted on a SRS website page to	UNM has revised and began implementing its IDDE program.

B. Procedures for enforcement, including enforcement escalation procedures for recalcitrant or repeat offenders; C. Procedures for removing the source of the discharge; D. Procedures for program evaluation and assessment; and E. Procedures for coordination with adjacent municipalities and/or state, tribal, or federal regulatory agencies to address situations where investigations indicate the illicit discharge originates outside the MS4 jurisdiction.	• In addition, any newly discovered non-storm water discharges will be assessed for their potential impact to the Rio Grande. SRS will review compliance records to check for similar incidents and will prioritize preventing repeat issues by increased awareness. SRS will manage UNM's IDDE Program and maintain maps applicable to the campus. • SRS will check both wet and dry storm water discharges. Initial assessments of storm water quality will occur by visual and olfactory methods. If suspicious water quality conditions are encountered visually, then water quality samples may be tested with field instrumentation, e.g., conductivity, pH, temperature and perhaps dissolved oxygen or turbidity. • If visual and field instrumentation assessment is unsatisfactory and other contamination is suspected (e.g., heavier than normal oil sheen), then grab samples may be collected for potentially applicable lab analysis by EPA methods, e.g., TPH, BTEX, E. Coli, nitrates/nitrite, etc. • If unusual levels of water quality contaminants are observed, UNM will analyze the above information to try to track back to the source on campus or where up-gradient contamination enters campus. UNM will notify up-gradient MS4 entities if we encounter contamination from their jurisdiction entering campus.	inform any interested members of the campus or local communities. • SRS will incorporate that finding into storm water quality training for the associated UNM staff that can best control the problem. • SRS will conduct at least visual IDDE assessment during at least one storm per month during the July-August monsoon season for rainfall occurring during normal 9am to 5pm business hours. • SRS will conduct one other visual IDDE assessment during one rainstorm outside of the July-August monsoon season for rainfall occurring during normal 9am to 5pm business hours. • SRS UNM will conduct one visual IDDE assessment of snow melt during at least one snowstorm occurring during normal 9am to 5pm business hours.	

5.4. Develop an education program as required in Part I.D.5.e.(i)(d): (d) Develop an education program to promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials. The permittee shall inform public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste.	• By June 20, 2016, SRS will include in its education program, information to promote and facilitate anonymous reporting of illicit connections or discharges by the campus community.		A written education program has been completed. Copies are available upon request.
5.5. Establish a hotline as required in Part I.D.5.e.(i)(e): (e) Establish a hotline to address complaints from the public.	• Complaints from the public can be directed to SRS, which will conduct an investigation or notify the appropriate parties.	• Complaints from the public will be tracked, recorded and reported.	SRS has a 24/7 Duty Officer program where complaints can be reported.
5.6. Investigate suspected significant/severe illicit discharges as required in Part I.D.5.e.(i)(f); (f) Investigate suspected significant/severe illicit discharges within forty-eight (48) hours of detection and all other discharges as soon as practicable; elimination of such discharges as expeditiously as possible; and, requirement of immediate cessation of illicit discharges upon confirmation of responsible parties.	• SRS will investigate all suspected significant/severe illicit discharges within forty-eight (48) hours of detection and all other discharges as soon as practicable; eliminate such discharges as expeditiously as possible; and, require immediate cessation of illicit discharges upon confirmation of responsible parties. A review of the inspection process will be completed by June 20, 2016.	• An update will be provided in the annual report.	A review of the investigation process was completed as part of the updates to the IDDE plan and is included in the IDDE plan. During the reporting period there were no reported suspected significant/severe illicit discharges.
5.7. Review complaint records and develop a targeted source reduction program as required in Part I.D.5.e.(i)(g): (g) Review complaint records for the last permit term and develop a targeted source reduction program for those illicit discharge/improper disposal incidents that have occurred more than twice in two (2) or more years from different locations. (Applicable only to class A and B permittees)	• SRS will maintain a log of complaint records from the last permit term and target source reduction efforts to repeat discharge incidents.	• An update will be provided in the annual report.	SRS did not receive any complaints during the reporting period.
5.8. Screening of system as required in Part I.D.5.e.(iii) as follows: (iii) The permittee must screen the entire jurisdiction at least once every five (5) years and high priority areas at least once every year. High priority areas include any area where there is ongoing evidence of illicit discharges or dumping, or where there are citizen complaints on more	• The screening will occur as part of the IDDE program by SRS. Screening will be done according to the schedule in the pemit.	• An update will be provided in the annual report.	UNM conducted screening for illicit discharge as part of the IDDE program.

than five (5) separate events within twelve (12) months. The permittee must: (a) Include in its SWMP document a description of the means, methods, quality assurance and controls protocols, and schedule for successfully implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis evaluation of data collected. (b) Comply with the dry weather screening program established in Table 6 and the monitoring requirements specified in Part III.A.2. (c) If applicable, implement the priority ranking system develop in previous permit term.			
5.9. Develop, update, and implement a Waste Collection Program as required in Part I.D.5.e.(iv): (iv) Waste Collection Programs: The permittee must develop, update, and implement programs to collect used motor vehicle fluids (at a minimum, oil and antifreeze) for recycle, reuse, or proper disposal, and to collect household hazardous waste materials (including paint, solvents, fertilizers, pesticides, herbicides, and other hazardous materials) for recycle, reuse, or proper disposal. Where available, collection programs operated by third parties may be a component of the programs. Permittees shall enhance these programs by establishing the following elements as a goal in the SWMP: A. Increasing the frequency of the collection days hosted; B. Expanding the program to include commercial fats, oils and greases; and C. Coordinating program efforts between applicable permittee departments.	• PPD's O&M program will identify waste disposal standard operating procedures (SOPs), including SOPs for motor vehicle fluids, toxic paints, solvents, fertilizers, pesticides, herbicides and any other hazmat. This will include a list of opportunities for recycling substances. Also standard operating procedures will address the removal of sediments, debris, floatables and litter including pet wastes. This will be completed by June 20, 2017.	• The annual report will include a discussion on any updates to an existing PPD O&M program and SOPs or development of new program and SOPs.	PPD continued to maintain a waste collection program. Review of that program continued throughout the reporting period.
5.10. Develop, update and implement a Spill Prevention and Response program to prevent, contain, and respond to spills that may discharge into the MS4	• UNM's SRS department has developed and regularly updates spill prevention and response	• Responses to spills that have the potential to impact water	SRS maintained a 24/7 spill response team and an on-call spill response contractor. SRS also maintained the

as required in Part I.D.5.e.(v): (v) Spill Prevention and Response. The permittee must develop, update and implement a program to prevent, contain, and respond to spills that may discharge into the MS4. The permittees must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The Spill Prevention and Response program shall include: (a) Where discharge of material resulting from a spill is necessary to prevent loss of life, personal injury, or severe property damage, the permittee(s) shall take, or insure the party responsible for the spill takes, all reasonable steps to control or prevent any adverse effects to human health or the environment: and (b) The spill response program may include a combination of spill response actions by the permittee (and/or another public or private entity), and legal requirements for private entities within the permittee's municipal jurisdiction.	programs, and has staff trained to respond to chemical spills. SRS also has a 27/4 Duty Officer pager number where all spills are reported. A complete review of these programs will be completed by June 20, 2017.	quality will be reported in the annual report.	27/7 Duty Officer program through which spills and other emergencies can be reported to SRS personnel. UNM also updated its SPCC plan during the reporting period. The updated plan is available upon request. There were no updates to the spill prevention and response program during the reporting period. During the reporting period, there was no response to spills that have the potential to impact water quality will be reported in the annual report.
5.11. Enhance the program to include requirements in Part I.D.5.e.(ix): (ix) The permittee may: (a) Divide the jurisdiction into assessment areas where monitoring at fewer locations would still provide sufficient information to determine the presence or absence of illicit discharges within the larger area; (b) Downgrade high priority areas after the area has been screened at least once and there are citizen complaints on no more than five (5) separate events within a twelve (12) month period; (c) Rely on a cooperative program with other MS4s for detection and elimination of illicit discharges and illegal dumping;	• SRS will look at the different subbasins and where feasible, divide them into different assessment areas. These assessment areas may be ranked in order of priority for screening purposes.	• An update on progress will be included in the annual report.	This process is ongoing and will continue through the next reporting period.

(d) If participating in a cooperative program with other MS4s, required detection program frequencies may be based on the combined jurisdictional area rather than individual jurisdictional areas and may use assessment areas crossing jurisdictional boundaries to reduce total number of screening locations (e.g., a shared single screening location that would provide information on more than one jurisdiction); and (e) After screening a non-high priority area once, adopt an "in response to complaints only" IDDE for that area provided there are citizen complaints on no more than two (2) separate events within a twelve (12) month period. (f) Enhance the program to utilize procedures and methodologies consistent with those described in "Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments."			
5.12. Describe other proposed activities to address the Illicit Discharges and Improper Disposal Measure:	• No additional activities are being proposed at this time. UNM will continue to explore additional activities to address the Illicit Discharges and Improper Disposal Measure.	• Additional proposed activities will be reported in the annual report.	

CONTROL OF FLOATABLES DISCHARGES

Permit Activity	Proposed Plan	Measurable Goal	Status
6.1. Develop a schedule to implement the program as required in Part I.D.5.f.(i)(a): (i) The permittee must develop, update, and implement a program to address and control floatables in discharges into the MS4. The floatables control program shall include source controls and, where necessary, structural controls. Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The following elements must be included in the program: (a) Develop a schedule for implementation of the program to control floatables in discharges into the MS4 (Note: AMAFCA and the City of Albuquerque should update the schedule according to the findings of the 2005 AMAFCA/COA Floatable and Gross Pollutant Study and other studies); and	• UNM installed water quality inlets in new facilities on the campus to control floatables discharge. Additionally, UNM may have the most intensive litter removal and street and sidewalk sweeping program in the Albuquerque metro area that removes floatables from the campus grounds before they can come into contact with storm water. These activities are continuous. • By June 2016 UNM will finalize a schedule to implement new floatable controls in new campus building projects that involve modification of storm water inlets or other MS4 system improvements. Floatable controls will be designed to capture the kinds of floatables present at UNM. • PDD will continue to track and report the estimated volume of floatables and trash removed from our control facilities. Beginning in June 2017, PPD will start characterizing the types of floatables removed from control facilities.	To implement a schedule for implementation of controls as SRS becomes aware of construction projects and as funding is identified. Include discussion of volume and type of trash removed in Annual Reports.	UNM grounds and landscaping personnel continued implementing cleaning and maintenance on stormwater inlets that trap floatables and other debris. Total yardage of debris removed during street and hardscape sweeping and cleaning operations was 975 yards.

WASTE COLLECTION PROGRAMS

Permit Activity	Proposed Plan	Measurable Goal	
	• UNM carefully collects and disposes of all wastes that could be hazardous to storm water quality. For instance, the SRS Department picks up and properly disposes of UNM's hazardous wastes in compliance with RCRA requirements. SRS, PPD and other UNM departments properly manage and dispose of regulated universal wastes and other special wastes. UNM policy UBPP 7780 forbids automotive maintenance activities on campus outside of the fleet and equipment maintenance operations at the PPD Automotive Center. UNM is expanding its waste collection program to include fats, oils and greases. UNM continues to coordinate waste collection efforts amongst departments.	• Incorporation of Household Hazardous Waste location/schedule information on educational brochures.	
6.2. Describe the plan to estimate the annual volume of floatables and trash removed from each control facility and characterize the floatable type as required in Part I.D.5.f.(i)(b): (b) Estimate the annual volume of floatables and trash removed from each control facility and characterize the floatable type.	• PPD will continue to track and report the estimated volume of floatables and trash removed from our control facilities. Beginning in October 2016, PPD will start characterizing the types of floatables removed from control facilities.	The progress and estimated volume of floatables will be reported in the annual report.	Upon review, UNM does not have any major stormwater control facilities.
6.3. Describe other proposed activities to address the Control of Floatables Discharges Measure:	• No additional activities are being proposed at this time. UNM will continue to explore additional activities to address the Control of Floatables Discharges Measure.	Additional proposed activities will be reported in the annual report.	

PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

Permit Activity	Proposed Plan	Measurable Goal	
7.1. Develop, revise, implement, and maintain an education and outreach program as required in Part I.D.5.g.(i) and Part I.D.5.g.(ii): (i) The permittee shall, individually or cooperatively, develop, revise, implement, and maintain a comprehensive stormwater program to educate the community, employees, businesses, and the general public of hazards associated with the illegal discharges and improper disposal of waste and about the impact that stormwater discharges on local waterways, as well as the steps that the public can take to reduce pollutants in stormwater. Permittees previously covered under NMS000101 and NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. (ii) The permittee must implement a public education program to distribute educational knowledge to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff. The permittee must: (a) Define the goals and objectives of the program based on high priority community-wide issues; (b) Develop or utilize appropriate educational materials, such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, and websites; (c) Inform individuals and households about ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including	• UNM is actively involved in providing public education and outreach regarding storm water impacts in the Albuquerque area watershed. UNM's efforts are aimed to educate the public about storm water pollution and how citizens can control the impact of storm water pollution. Some activities that UNM is involved in include: (1) posting storm water information on the SRS Department website; (2) publishing storm water information in the UNM Today, UNM New Minute or The Daily Lobo publications; (3) participating in new faculty orientation and new student orientation; and (4) providing Stormwater training to UNM staff. The information that UNM provides includes the proper handling, disposal and recycling of used motor vehicle fluids, household hazardous wastes, grass clippings, car wash water, use of fertilizers, pesticides and herbicides, oil and toxics on roadways and the steps to report illicit discharges and improper disposal. Further, UNM educates pet owners about proper disposal of pet wastes. • UNM's SRS Department works with PPD to maintain pet waste collection stations on its Main Campus. SRS also educates owners and operators of UNM-related facilities regarding their responsibility to control pollutants in storm water discharges from their property to the MS4 by including storm water pollution prevention training to UNM Building Coordinators and staff. SRS is also including storm water education in its Basic Annual Safety Training required to be taken annually by all UNM employees.	• Discussion of additional education and outreach activities performed by UNM staff will be provided in the Annual Reports. • Outreach efforts will continue to be summarized in the Annual Reports.	SRS continued to maintain storm drain caps on storm drain inlets across campus with the message "No Dumping, only Rain in the Drain." SRS participated in "Welcome back days" at the beginning of the semester, and handed out fliers with Stormwater education literature. UNM ran 14 radio ads on KUNM that focused on cleaning up after pets.

fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes; (d) Inform individuals and groups how to become involved in local stream and beach restoration activities as well as activities that are coordinated by youth service and conservation corps or other citizen groups; (e) Use tailored public education program, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed cleanups; and (f) Use materials or outreach programs directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts. For example, providing information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. The permittee may tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children. The permittee must make information available for non-English speaking residents, where appropriate.			

7.2. Enhance the program to include requirements in Part I.D.5.g.(v) through Part I.D.5.g.(viii): (v) Where necessary to comply with the Minimum Control Measures established in Part I.D.5.g.(i) and Part I.D.5.g.(ii), the permittee should develop a program or modify/revise an existing education and outreach program to: (a) Promote, publicize, and facilitate the use of Green Infrastructure (GI)/Low Impact Development (LID)/Sustainability practices; and (b) Include an integrated public education program (including all permittee departments and programs within the MS4) regarding litter reduction, reduction in pesticide/herbicide use, recycling and proper disposal (including yard waste, hazardous waste materials, and used motor vehicle fluids), and GI/LID/Sustainable practices (including xeriscaping, reduced water consumption, water harvesting practices allowed by the New Mexico State Engineer Office). (vi) The permittee may collaborate or partner with other MS4 operators to maximize the program and cost effectiveness of the required outreach. (vii) The education and outreach program may use citizen hotlines as a low-cost strategy to engage the public in illicit discharge surveillance. (viii) The permittee may use stormwater educational materials provided by the State, Tribe, EPA, environmental, public interest or trade organizations, or other MS4s. The permittee may also integrate the education and outreach program with existing education and outreach programs in the Middle Rio Grande area. Example of existing programs include: (a) Classroom education on stormwater; A. Develop watershed map to help students visualize area			

impacted. B. Develop pet-specific education (b) Establish a water committee/advisor group; (c) Contribute and participate in Stormwater Quality Team; (d) Education/outreach for commercial activities; (e) Hold regular employee trainings with industry groups (f) Education of lawn and garden activities; (g) Education on sustainable practices; (h) Education/outreach of pet waste management; (i) Education on the proper disposal of household hazardous waste; (j) Education/outreach programs aimed at minority and disadvantaged communities and children; (k) Education/outreach of trash management; (l) Education/outreach in public events; A. Participate in local events—brochures, posters, etc. B. Participate in regional events (i.e., State Fair, Balloon Fiesta). (m) Education/outreach using the media (e.g. publish local newsletters); (n) Education/outreach on water conservation practices designed to reduce pollutants in storm water for home residences. **7.3. Describe other proposed activities to address the Public Education and Outreach on Stormwater** **Impacts Measure:**			

PUBLIC INVOLVEMENT AND PARTICIPATION

Permit Activity	Proposed Plan	Measurable Goal	Status
8.1. Develop (or update), implement, and maintain a public involvement and participation plan as required in Part I.D.5.h.(ii) and Part I.D.5.h.(iii): (ii) The permittee shall develop, revise, implement and maintain a plan to encourage public involvement and provide opportunities for participation in the review, modification and implementation of the SWMP; develop and implement a process by which public comments to the plan are received and reviewed by the person(s) responsible for the SWMP; and, make the SWMP available to the public and to the operator of any MS4 or Tribal authority receiving discharges from the MS4. Permittee previously covered under NMS000101 or NMR040000 must continue existing public involvement and participation programs while updating those programs, as necessary, to comply with the requirements of this permit. (iii) The plan required in Part I.D.5.h.(ii) shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The permittee must include the following elements in the plan: (a) A detailed description of the general plan for informing the public of involvement and participation opportunities, including types of activities; target audiences; how interested parties may access the SWMP; and how the public was involved in development of the SWMP; (b) The development and implementation of at least one (1) assessment of public behavioral change following a public education and/or participation event;	• UNM continues to welcome public participation in its SWMP. The SRS Department continues involving other UNM departments, e.g., PPD, OCP, etc., as stakeholders in the development and revision of UNM's SWMP. UNM also participates in local Albuquerque area public forums where active public involvement occurs, e.g., the Technical Advisory Group on Stormwater issues. • SRS Department regularly trains and updates other UNM Departments about storm water issues and solicits input and participation. In 2015, SRS provided a presentation at the Loss Prevention & Control Safety Committee Meeting to insure that all UNM stakeholders are aware of the SWMP and its requirements.	Discussion of public input and their comments will be provided in the Annual Report.	UNM requested public participation in its SWMP. The SRS Department continues involving other UNM departments, e.g., PPD, OCP, etc., as stakeholders in the development and revision of UNM's SWMP. SRS also participated in local Albuquerque area public forums where active public involvement occurs, e.g., the Technical Advisory Group on Stormwater issues.

(c) A process to solicit involvement by environmental groups, environmental justice communities, civic organizations or other neighborhoods/organizations interested in water quality-related issues, including but not limited to the Middle Rio Grande Water Quality Work Group, the Middle Rio Grande Bosque Initiative, the Middle Rio Grande Endangered Species Act Collaborative Program, the Middle Rio Grande-Albuquerque Reach Watershed Group, the Pueblos of Santa Ana, Sandia and Isleta, Albuquerque Bernalillo County Water Utility Authority, UNM Colleges and Schools, and Chartered Student Organizations; and (d) An evaluation of opportunities to utilize volunteers for stormwater pollution prevention activities and awareness throughout the area.			
8.2. Describe the plan to comply with State, Tribal, and local notice requirements when implementing a Public Involvement and Participation Program as required in Part I.D.5.h.(iv): (iv) The permittee shall comply with State, Tribal and local public notice requirements when implementing a public involvement/ participation program.	• UNM provided public notice of its plan to submit a NOI and SWMP to the EPA. The notice was published in the Albquerque Journal. The draft NOI and SWMP were published on the SRS website, with copies available at the Zimmerman Library, and the public was allowed 30 days to submit written comments.		
8.3. Describe a plan to include elements as required in Part I.D.5.h.(v): (v) The public participation process must reach out to all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local stormwater management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre- existing programs, or participating in volunteer monitoring efforts.			
8.4. As required in Part I.D.5.h.(viii) provide the internet site (or website) where the SWMP document, Annual Reports, and other documents will be available to the public:	SRS will publish UNM's SWMP and Annual Reports on its website and provide a forum to seek and address input from the public.		

(viii) The permittee must provide public accessibility of the Storm Water Management Program (SWMP) document and Annual Reports online via the Internet and during normal business hours at the MS4 operator's main office, a local library, posting on the internet and/or other readily accessible location for public inspection and copying consistent with any applicable federal, state, tribal, or local open records requirements. Upon a showing of significant public interest, the MS4 operator is encouraged to hold a public meeting (or include in the agenda of in a regularly scheduled city council meeting, etc.) on the NOI, SWMP, and Annual Reports. (See Part III B)			
8.5. Enhance the program to include requirements in Part I.D.5.h.(ix): (ix) The permittee may integrate the public Involvement and participation program with existing education and outreach programs in the Middle Rio Grande area. Example of existing programs include: Adopt-A- Stream Programs; Attitude Surveys; Community Hotlines (e.g. establishment of a "311"-type number and system established to handle storm-water-related concerns, setting up a public tracking/reporting system, using phones and social media); Revegetation Programs; Storm Drain Stenciling Programs; Stream cleanup and Monitoring program/events.			
8.6. Describe other proposed activities to address the Public Involvement and Participation Measure:			

DISCHARGES TO IMPAIRED WATERS

Permit Activity	Proposed Plan	Measurable Goal	Status
2.b) The permittee shall control the discharges of pollutant(s) of concern to impaired waters and waters with approved TMDLs as provided in sections (i) and (ii) below, and shall assess the success in controlling those pollutants. **(i) Discharges to Water Quality Impaired Water Bodies with an Approved TMDL** If the permittee discharges to an impaired water body with an approved TMDL (see Appendix B of permit), where stormwater has the potential to cause or contribute to the impairment, the permittee shall include in the SWMP controls targeting the pollutant(s) of concern along with any additional or modified controls required in the TMDL and this section. The SWMP and required annual reports must include information on implementing any focused controls required to reduce the pollutant(s) of concern. **(ii) Discharges Directly to Water Quality Impaired Water Bodies without an Approved TMDL:** The permittee shall also determine whether the permitted discharge is directly to one or more water quality impaired water bodies where a TMDL has not yet been approved by NMED and EPA. If the permittee discharges directly into an impaired water body without an approved TMDL, the permittee shall perform certain activities (see permit for full description of such activities).	UNM continues to implement practices that reduce bacterial contamination of storm water. Most of these practices have multi-purpose benefits in addition to storm water pollution prevention and bacterial reduction. These ongoing practices involve the structural best management practices (BMPs) in the operation of our facilities and grounds as well as our public education and outreach efforts. The following describes UNM's program to minimize contamination of storm water. UNM is aware of the bacterial source tracking study in the local Middle Rio Grande watershed which identified the various source animal enteric bacteria contributions. The study indicated that birds contributed the most at roughly a third of the bacteria loading. Dogs were the second largest source. Therefore, UNM's efforts have been focused on controlling bird and dog waste impacts on storm water. a) **Dog Poop Stations** - UNM's campus is open to the public and people do walk their dogs on campus. This activity is centered around the green spaces, e.g., the Duck Pond on the Central Campus and Golf Course on North Campus. PPD has installed and maintains dog poop disposal bag dispensers on the east and west sides of the Duck Pond area. The North Campus Neighborhood Association has been stocking shopping bags for similar purposes on the southeast corner of the North Golf Course where many folks begin on the perimeter jogging trail. This is also a notable example of public involvement with storm water pollution prevention on campus. b) **Bird Controls** - UNM continues bird control efforts, especially related to roosting pigeons on UNM buildings. Bird control efforts range from netting at Coronado dormitory trash storage area, equipment bird skirting at the Business Center and bird control wires on the Electrical Engineering & Computer Engineering building window sills. UNM also has an ongoing trapping program that captures hundreds of pigeons a year on many campus roof tops or wherever there may be a roosting problem. c) **Street and Sidewalk Sweeping** - UNM makes a great effort to keep the campus grounds beautiful. PPD efforts include regular street sweeping and sidewalk sweeping. UNM's street sweeping schedule may be among the most frequent in the metro area, and this serves to protect storm water quality from contaminants,	Submission of water quality monitoring results in DMRs and Annual Reports. UNM relies upon the COA and USGS work pursuant to an existing MOU Agreement, until this MOU is replaced by a new cooperative monitoring program agreement. WLA to be submitted with annual report.	UNM entered into a monitoring cooperative and signed an intergovernmental agreement with several agencies during the reporting cycle. It also provided the EPA a monitoring plan and certification to start monitoring stormwater. Monitoring results (DMRs) will be reported by one of the co-permittees (AMAFCA) on behalf of the cooperative.

	including bacteria laden animal wastes on hard-scaping. d) **Trash & Litter Controls** -The local bacterial tracking study also indicated that humans are one of the smaller sources of bacterial contamination to storm water. In addition to the homeless population in the metro area that may not be using bathrooms, it was recognized that leaking trash dumpsters and compactors may contribute to some of the human contamination. Therefore, lids are installed and kept closed on UNM's large trash dumpsters to keep storm water out. The multitude of small trash receptacles along campus sidewalks, at building entrances, etc. are also always lined with trash bags and usually topped with lids that allow trash in and keep it inside. Bagging and lids also prevent wind from blowing trash out of dumpsters and receptacles. e) **Leaked Fluid**-If trash compactors leak fluids, the standard practice at UNM is to absorb the leaked fluids and dispose of the absorbent with the other solid waste. Litter is picked up daily, Monday through Friday, all over campus and is disposed of properly with other solid wastes. Litter pickup includes scooping visible dog poop as well as floatables/litter. UNM notifies the COA about problems with pet wastes being left from occupants of neighboring apartment complexes who bring their dogs onto campus property to defecate. f) **Storm water Retention Ponds** - UNM has a few storm water retention ponds on the South Campus and on the North Campus. In addition to reducing peak flow into the local MS4, these ponds act to settle out suspended solids and expose bacteria to solar UV radiation. Solar UV disinfection and settling out suspended solids both help to reduce bacteria levels in storm water discharged from campus. g) **Public Education and Outreach & Campus Training** - Storm water pollution prevention training and test questions will become part of UNM's Mandatory Basic Annual Safety Training (BAST) program for all UNM employees. Additionally, UNM's Safety & Risk Services (SRS) department conducts specialized storm water pollution prevention training to PPD employees. SRS's specialized training includes an emphasis on pet waste pickup and measures to minimize bacterial, nutrient and sediment contamination. At UNM's Welcome Back Days event at the beginning of each semester, SRS has had booths with handouts on storm water pollution prevention including pet wastes and measures to minimize		

	bacterial contamination. SRS's website also has information on storm water pollution prevention including pet wastes and measures to minimize bacterial contamination. UNM continues to operate pursuant to the COA bacterial program as necessary for consistency with the new E-Coli TMDL. UNM, as a Phase 1 MS4 participant in a cooperative monitoring program with the COA, AMAFCA and New Mexico Department of Transportation continues to pay a share of the monitoring costs for storm water monitoring work. UNM remains involved in the decisions and reports that this monitoring cooperative generates until such time when a new monitoring cooperative is formed. UNM will calculate WLA for impaired waters and may coordinate efforts with other watershed permittees.		

WET WEATHER MONITORING

Permit Activity	Proposed Plan	Measurable Goal	Status

As described in Part III, A.1, permittees shall conduct wet weather monitoring to gather information on the response of receiving waters to wet weather discharges from the MS4 during both wet season (July 1 through October 31) and dry Season (November 1 through June 30). Wet Weather Monitoring shall be conducted at outfalls, internal sampling stations, and/or in-stream monitoring locations at each water of the US that runs in each entity or entities' jurisdiction(s). Permittees may choose either Option A (individual monitoring) or Option B (cooprerative monitoring program). As described in Part III A.1.b: Cooprerative monitoring program will monitor waters coming into the watershed (upstream) and leaving the watershed (downstream). Include sampling for TSS, TDS, COD, BOD5, DO, oil and grease, E.coli, pH, total kjeldahl nitrogen, nitrate plus nitrite, dissolved phosphorus, total ammonia plus organic nitrogen, total phosphorus, PCBs and Gross alpha. Monitoring for temperature at outfalls and/or Rio Grande monitoring locations. Include additional parameters from monitoring conducted under permits NMS000101, NMR040000 or/and NMR04000I whose mean values are at or above a WQS. Sample the pollutants for a minimum of 7 storm events per location during the permit term with at least 3 events wet season and 2 events in dry season.	All discharges during a storm event are collected at outfall locations. • UNM and its current MS4 partners have hired the USGS to perform sample collection at 5 representative outfall locations. If new wet weather monitoring sites are installed, certification that they are operational, and actual monitoring at these sites will be provided by April 15, 2016. A detailed description of the monitoring scheme will be submitted for EPA and NMED approval by December 2015. Samples will be analyzed for all of the parameters in Part III A.1.b according to the schedule in Part III A.1.b for wet weather. • Composite samples are collected using an automated ISCO sampling device. Grab samples are collected by USGS personnel. Temperature probes continuously record air and water temperatures. Sondes are used to monitor D.O., water temperature, and conductivity.	• Provide results of the assessment in each annual report.	UNM entered into a monitoring cooperative and signed an intergovernmental agreement with several agencies during the reporting cycle. It also provided the EPA a monitoring plan and certification to start monitoring stormwater. Monitoring results (DMRs) will be reported by one of the co-permittees (AMAFCA) on behalf of the cooperative.

DRY WEATHER DISCHARGE SCREENING OF MS4

Permit Activity	Proposed Plan	Measurable Goal	Status
As described in part III.A.2, permittee shall: Identify, investigate, and address areas within its jurisdiction that may be contributing excessive levels of pollutants to the Municipal Separate Storm Sewer System as a result of dry weather discharges (i.e., discharges from separate storm sewers that occur without the direct influence of runoff from storm events, e.g. illicit discharges, allowable non-stormwater, groundwater infiltration, etc.). Due to the arid and semi-arid conditions of the area, the dry weather discharges screening program may be carried out during both wet season (July 1 through October 31) and dry Season (November 1 through June 30). This program may be coordinated with the illicit discharge detection and elimination program required in Part I.D.5.e. Include sufficient screening points to adequately assess pollutant levels from all areas of the MS4. Screen for, at a minimum, BOD5, sediment or a parameter addressing sediment (e.g., TSS or turbidity), E. coli, Oil and Grease, nutrients, any pollutant that has been identified as cause of impairment of a waterbody receiving discharges from that portion of the MS4, including temperature. Specify the sampling and non-sampling techniques to be issued for initial screening and follow-up purposes. Sample collection and analysis need not conform to the requirements of 40 CFR Part 136; and Perform monitoring only when an antecedent dry period of at least seventy-two (72) hours after a rain event greater than 0.1 inch in magnitude is satisfied.	• There are no perennial streams in the Albuquerque Metropolitan area. As such, the dry weather screening program serves a dual purpose as an illicit discharge screening analysis. Seventeen locations, which screen 100% of the MS4 and target industrial areas, have been chosen. Should any discharge be present in a quantity sufficient for analysis, it will be screened for BOD5, sediment or a parameter addressing sediment (e.g.,TSS or turbidity), *E. coli*, Oil and Grease, and nutrients. Any discharge collected will be a grab sample.	• Provide results of the assessment in each annual report.	Dry weather screening was done as part of the IDDE.

Table 1

UNM Storm Drain Inlets for Quarterly Maintenance and Measurement Operations

Inlet #	LOCATION
1.	West of Centennial Engineering (Bldg.122) in roadway along West Curb line
2.	West of Hibben Center (Bldg. 15) in bump out on West side of road (2-inlets)
3.	North of Zimmerman (Bldg. 53) in parking lot
4.	Walkway east of Zimmerman (Bldg. 53) and East of Collage of Education (Bldg. 57)
5.	SE of Hokona Zia (Bldg. 58) in Redondo Way
6.	NE of Simpson Hall (Bldg. 66) in Redondo Way
7.	South of Santa Clara (Bldg. 61) in Redondo Way
8.	North of SRC Commons (Bldg. 88)
9.	NE of Mesa Vista (Bldg. 56) at Area 3
10.	South side of Duck Pond
11.	SE side of Scholes Hall (Bldg. 10)
12.	SW of Chapel (Bldg. 25)
13.	East of Bandelier Hall East (Bldg. 8) at Rose Garden
14.	North side of EECE (Bldg. 46) in south end of parking lot
15.	NW of Ford Utilities (Bldg. 116) in parking lot
16.	SW corner of Novitski Hall (Bldg. 249) in SW corner of south parking lot
17.	South side Of HSSB (Bldg. 266) in walkway
18.	NW of HSSB (Bldg. 266) in lawn area
19.	NW of Novitski Hall (Bldg. 249) in SE corner of north parking lot (2-inlets)
20.	NW of Observatory (Bldg. 208) in NW corner of parking lot.

Created by PPD

Version Date: Sept. 1, 2012

SAFETY & RISK SERVICES CONSTRUCTION SITE MANAGEMENT AND INSPECTION PROGRAM

INTRODUCTION:

In compliance with provisions of the Clean Water Act, construction activities that will disturb one or more acres of land or will disturb less than one acre of land but are part of a common plan of development or sale that will ultimately disturb one or more acres of land, prior to commencing construction activities, are required to submit a Notice of Intent (NOI) to the EPA and to prepare and comply with a Stormwater Pollution Prevention Plan (SWPPP). Construction activities that will disturb less than one acre of land are not required to submit a NOI. However, the University of New Mexico (UNM) requires that such projects develop a SWPPP specific to the construction site and adhere to the SRS Contractor Requirements with regards to stormwater pollution control.

PURPOSE

1. Standardize procedures for conducting, documenting and tracking inspections, for stormwater compliance at UNM construction sites.
2. Establish which personnel are responsible for performing and documenting and tracking stormwater compliance inspections.
3. Establish areas of responsibility when it comes to compliance with UNM's NPDES permit as it relates to construction sites.

SCOPE

- Construction sites with disturbed area less than one acre.
- Construction sites with disturbed area greater than one acre.

DEFINITIONS

Best Management Practices (BMPs) means activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Storm Water Pollution Prevention Plan is a written plan that documents the selection and implementation of BMPs for a particular facility or construction project.

RESPONSIBILITIES

UNM Project Managers

- Include SWPPP specifications in contractor bids and contracts. Ensures the contractors develop and submit for their approval a site specific SWPPP.
- Provide a copy of the SWPPP to SRS for review
- Ensure that contractor complies with the SWPPP

Safety & Risk Services Department

- Review contractor SWPPP and report discrepancies to the Project Manager.
- Inspect construction sites to ensure compliance with SWPPP and environmental laws and regulations.
- Report discrepancies to the UNM Project Manager.

Contractor

- Develop a site specific SWPPP
- Develop and implement strategies which include a combination of structural and/or nonstructural BMPs.
- Develop and incorporate post construction BMPs into the project.
- Perform ongoing storm water pollution prevention inspections throughout the period of construction.
- Take corrective action whenever necessary to prevent storm water or other runoff from the construction site into the stormwater system or gutters and culverts leading to that system.

CONSTRUCTION SITE INSPECTIONS/DOCUMENTATION

The Safety & Risk Services Department is responsible for completing construction site inspections and follow-up inspections.

- Use the attached Storm water Compliance Inspection checklist.
- Take photos of identified deficiencies.
- Email a PDF copy of the completed inspection checklist and photos to the UNM Project Manager and request that any deficiencies be addressed immediately.

Frequency of inspections:

- Conduct inspections at least monthly, and within 24 hours of a storm event.
- Consider current and past SWPPP compliance. If there is a history of noncompliance then the site will be inspected more frequently until compliance is met.
- Conduct routine inspections during construction activity (at the minimum frequency identified above). Use the first section of the inspection checklist.
- Conduct a final inspection of the site once the contractor has completed the project, or where applicable, when contractor has filed a Notice of Termination (NOT) with the EPA. Use the second section of the inspection checklist.

INSPECTION LOG

Update the inspection log after each inspection. The inspection log should include a list of construction sites, scheduled inspection dates, and other SWPPP related information. All construction sites are to be included in the log. The inspection log is attached.

Priority construction sites are identified using the following criteria:

- Current and past SWPPP compliance.
    1. If owner operator has a history of negligence then the site will be inspected more frequently until compliance is met
- Sites greater than 1 acre and sites where there is active construction during monsoon season and during high wind season should be given priority.

ENFORCEMENT ACTION

The UNM project manager is responsible for enforcement. They can seek damages or withhold payment to contractors.

DOCUMENTATION

- SRS personnel conducting inspections are responsible for updating the SWPPP Inspection log and for storing all SWPPP inspection reports, photos and other documentation electronically on the SRS share drive.
- Records of inspections and enforcement shall be kept for 5 years or until construction is completed, whichever is longer.

UNIVERSITY OF NEW MEXICO STORM WATER COMPLIANCE INSPECTION CHECKLIST

	PROJECT NAME:			
	STORM WATER COMPLIANCE INSPECTION – DURING CONSTRUCTION			
		YES	**NO**	**NA**
1	The contractor has posted the EPA Permit or the Notice of Intent form and the name of the site contact person at the entrance to the construction site.			
2	The contractor has provided a copy of the completed Notice of Intent and the Storm Water Pollution Prevention Plan (SWP3) to UNM.			
3	An up to date copy of the SWP3 is available on site.			
4	The Contractor has adhered to the sequence of soil disturbance activities identified in the SWP3.			
5	The Contractor has been instructed in the emergency procedures to follow in the event of a hazardous material release, if required.			
6	The Contractor has recorded the dates of major construction activities involving grading, stabilization, and work suspension.			
7	The Contractor has scheduled inspections of storm water control measures and discharge points; and the inspections are being performed by qualified personnel at the frequency stated in the SWP3.			
8	The Contractor has filed completed, signed inspection reports with the SWP3 that identify the dates of inspection, weather conditions, findings, and corrective actions.			
9	When an inspection reveals a requirement to amend the SWP3, the Contractor revises the SWP3 and provides the amended SWP3 to UNM within seven days.			
	Site Checks:			
10	Have disturbed areas been stabilized?			
11	Are storm drains protected?			
12	Are material stockpiles stabilized or isolated?			
13	Is sediment or debris visible at drains or discharge locations?			
14	Has sediment or loose gravel from the site entrance gotten on the street?			
15	Are any oils or chemicals stored near storm drains, discharge locations, or surface waters?			
16	Are runoff control measures (filter fabric, hay bales, silt fencing, etc.) being adequately maintained?			
17	Are any sediment ponds / traps silted to 1/4 capacity or more?			
	Additional Comments / Observations:			
	Inspector’s Name:			
	Inspection Date/Time:			
	Weather Conditions:			
	Inspector's Signature:			

UNIVERSITY OF NEW MEXICO STORM WATER COMPLIANCE INSPECTION CHECKLIST

	STORM WATER COMPLIANCE INSPECTION – POST CONSTRUCTION FINAL			
		YES	**NO**	**NA**
18	Contractor has completed all soil disturbing activities at the site.			
19	All storm water discharges associated with construction activity have been			
	eliminated.			
20	The Contractor has removed all temporary erosion and sediment control measures, or will provide for their removal at the appropriate time as identified in the SWP3.			
21	The Contractor has achieved final stabilization of all areas of the construction site for which he is responsible, where soil disturbing activities have been performed.			
22	Contractor has completed and submitted a Notice of Termination (NOT) to EPA within 30 days after:			
a	Final stabilization of all portions of the site for which the Contractor is responsible; or			
b	Another Operator has assumed control of all areas of the site that have not been finally stabilized; or			
c	Coverage under an alternate NPDES permit has been obtained.			
23	The Contractor has provided a copy of the Notice of Termination to UNM			
	Additional Comments / Observations:			
	Insector's Name:			
	Inspection Date/Time:			
	Weather Conditions: Overcast.			
	Inspector's Signature:			

UNM STORMWATER COMPLIANCE INSPECTION LOG

PROJECT NAME	PROJECT AREA (ac)	INSPECTION DATE	INSPECTION TYPE (PRE OR POST CONSTRUCTION)	VIOLATION (Y or N)	VIOLATION TYPE (*enter the number that matches the violation on the*	OUTCOME