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

NMR04A014 City of Albuquerque
Name of MS4

Name of Contact Person (First)	(Last)	(Title)
Kathleen	Verhage	Senior Engineer

Telephone (including area code)	E-mail
(505) 768-3654	kverhage@cabq.gov

PO Box 1293, City of Albuquerque, Dept of Municipal Development, Attn: Kathy Verhage Rm 301
Mailing Address

City	State	ZIP code
Albuquerque	NM	87103

What size population does your MS4(s) serve? 546,000 NPDES number

What is the reporting period for this report? (mm/dd/yyyy) From Jul 1, 2017 to Jun 30, 2018

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
Middle Rio Grande	E-coli	☒ Yes ☐ No	☒ Yes ☐ No
Middle Rio Grande	Temperature	☐ Yes ☒ No	☐ Yes ☐ No
Middle Rio Grande	Polychlorinated Biphenyls in Fi	☐ Yes ☒ No	☐ Yes ☐ No
Middle Rio Grande	Dissolved Oxygen	☐ 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?

Pet waste, household hazardous waste, trash and debris (including natural vegetation), sediments, automotive fluids including oil and grease, detergents. A "floatables study" and source testing have been performed. Birds are primary

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?

Our public education program targets pet waste, household hazardous waste, trash and debris (including natural vegetation), sediments, automotive fluids, detergents, fertilizers, pesticides

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.

Survey showed that over 90% of individuals understood the importance of pollution prevention and valued improved stormwater quality. Two household hazardous recycling events resulted in the participation of 820 individuals. See

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. 142

D. How many of the sites identified in 4.C did you inspect during this reporting period? 154

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

Each site greater than 1 ac is inspected at least once while active. Larger sites with longer active periods are inspected more frequently. On average, the COA performs 40 private development construction inspections per week.

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

If Yes, based on what criteria? Size, length of time open, direct impervious connection to a water of the US

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:

Used	Action	Number	No Authority
☒ Yes	Notice of violation	239	☐
☒ Yes	Administrative fines	13	☐
☐ Yes	Stop Work Orders		☒
☒ Yes	Civil penalties	0	☐
☐ Yes	Criminal actions		☒
☐ Yes	Administrative orders		☒
☒ Yes	Other	Second notice of violation	

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?

1. Sediment BMPs missing, require maintenance, or not installed (89) ; 2. Track-out, sediment in street or offsite, vehicle tracking control requires maintenance, or no vehicle tracking control (75); 3. No self-inspection reports (47)

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

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. 37 (see Item 10)

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?

37

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? see Item 10

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

Complaints regarding spills are investigated immediately (see item 10). The 37 Dry Weather Screening outfalls are screened annually during the Dry Season--typically sometime in November through March (see item 10 for more

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? see item 10

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

L. How often do municipal employees receive training on the illicit discharge program? Annually (appropriate de

6. Stormwater Management for Municipal Operations

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

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

Other: All COA golf courses have SWPPPs for their operations. General Parks and Open Spaces do not.

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

C. If Yes, at what frequency are inspections conducted? It depends. See Iter

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

Construction activities, detention pond cleaning, storm inlet and drain cleaning, fueling operations, storage of hazardous and non-hazardous materials, general good housekeeping operations, landfill operations

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?

Most frequent inspections occur at facilities that require a Multi Sector General Permit (Landfill and Transit). Good Housekeeping inspections are performed at general maintenance facilities quarterly and monthly if the facility has had

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?

Annual refreshers are provided. In addition, training materials have been provided to supervisors to be used when staff turns over and new employees are hired. On the spot training also occurs during inspections, as needed.

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

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

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

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

None required at this time.

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.)?

Per COA ordinance the following projects are reviewed: 1. more than 500 cubic yards fill exported or imported ; 2. Commercial projects that disturb >1000 sq ft , 3. Residential projects >1 Ac, 4. Parking lots >2000 sq ft, 5. grade change

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.

www.amlegal.com/albuquerque_nm/

G. How many development and redevelopment project plans were reviewed during the reporting period to assess impacts to water quality and receiving stream protection? 973

H. How many of the plans identified in 7.G were approved? 636

I. How many privately owned permanent stormwater management practices/facilities were inspected during the reporting period? 206

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? 30 days

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? Planning - Monthly

8. Program Resources

A. What was the annual expenditure to implement MS4 permit requirements this reporting period? $10.9 Million

B. What is next year's budget for implementing the requirements of your MS4 NPDES permit? $12 million

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:		Amount $	OR %
Source:	G.O. Bonds (NPDES, Water Quality Compliance)	1.1 Millio	
Source:	General Funds (Arroyo and Street Maintenance)	6.5 Millio	
Source:	Customer Billing (Household Hazardous Waste, Cl	3.3 Millio	

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)? 27 see It

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

Entity	Activity/Task/Responsibility	Your Oversight/Accountability Mechanism
AMAFCA, SCAFC.	Sampling and Monitoring Wet Weather	Memo of Understanding
AMAFCA, SCAFC.	Education and Outreach	Memo of Understanding
AMAFCA, SCAFC.	General Watershed Based Permit Imple	Memo of Understanding

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
Industrial Inspections	2014	MSGP required once per permit	1599 in FY2018
Student and General Public Education anc	2006	Reporting Annually, Events Held	Varies
Dry Weather Screening	2003	Annually	37 in FY 2018
Good Housekeeping Inspections	2012	Quarterly to Monthly (if needed)	34 locations, 134
Illicit Discharge Inspections	2016	Applicable businesses once per	281 in FY2018

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.

https://www.cabq.gov/municipaldevelopment/our-department/engineering/storm-water-management/municipal-separate-storm-sewer-system-ms4-permit.

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: Sarita Nair — Digitally signed by Sarita Nair DN: cn=Sarita Nair, o=City of Albuquerque, ou=Mayor's Office, email=snair@cabq.gov, c=US Date: 2018.11.26 09:37:16 -07'00'

Chief Administrative Officer — Name of Certifying Official, Title

11/20/2018 — Date (mm/dd/yyyy)

CITY OF ALBUQUERQUE

Annual Report for Fiscal Year 2018 (FY18)

July 1, 2017 to June 30, 2018

NPDES PERMIT NMR04A000, Effective Date December 22, 2014

eNOI Application Date June 21, 2015

ITEM 10 Additional Information

I.C. Special Conditions

1. Compliance with Water Quality Standards

d. Dissolved Oxygen (DO): The Arroyo Metropolitan Flood Control Authority (AMAFCA) continues to monitor the DO in the Rio Grande

e. Polychlorinated Biphenyls (PCBs): The COA began a sediment assessment study in FY16 which was completed in FY17 with a final letter report submitted in FY18 on July 10, 2017. Under this study, soil samples were taken from the 5 outfall locations monitored under the former Phase 1 permit NMS000101 as well as from up and down stream locations along the Rio Grande. These samples were analyzed for PCBs using the Aroclor method. Detection of PCBs at any of these location resulted in further sampling and analysis of upstream areas. Twelve locations were ultimately screened for both PCBs and select metals in the Phase II Assessment based upon the results of the original study. The Synthetic Precipitation Leaching Procedure (SPLP) was used to analyze the following metals: aluminum, cadmium, chromium, lead, nickel, and zinc. No PCBs were found in any of the sediment samples at concentration s above the detection limits that ranged from 0.019 to 0.2 milligrams per kilogram (mg/kg) for the six aroclors analyzed. Both studies are available in the FY17 Annual Report under Attachment 1. The Phase II Assessment has also been included in this year's Annual Report under Attachment 1.

f. Temperature: AMAFCA continues to monitor temperature in the Rio Grande and at the North Diversion Channel through the deployment of sondes. Analysis of stormwater flows for temperature under the former Phase 1 permit indicates no contribution to temperature exceedances in the Middle Rio Grande and continues to indicate no contribution to any potential temperature exceedances.

2. Discharges to Impaired Waters with and without approved TMDLs

b(i)(c)B: The Monitoring Cooperative has worked out most of the details of the sampling plan and sample collection. Access to the southernmost collection point, currently on the Isleta Pueblo is somewhat problematic in that it requires Pueblo consent. Access was denied during one rain event despite earlier permission. Hence the group collected an upstream sample but was unable to complete the downstream sampling.

The permittees under NMR04A000 have worked with the New Mexico Environment Department (NMED) staff on a methodology to calculate the bacterial load contributed by the source area during a storm event. The results of the Total Maximum Daily Load (TMDL) calculations using this methodology are also in Attachment 2.

During FY2018, 2 samples were collected during the wet season: one on July 27-28 and the second on September 27-28. No samples were collected during the dry season from November 1, 2017 through June 30, 2018. The Monitoring Cooperative has completed all of the wet weather monitoring required by the permit. A report that provides the results of the wet season sampling from the two storm events are included in Attachment 2. Copies of the Discharge Monitoring Reports (DMRs) submitted electronically in the NetDMR system and the results of the Total Maximum Daily Load (TMDL) calculations are also included in Attachment 2.

Potential e-coli exceedances occurred in both reaches (Angostura Diversion to Non-Pueblo Alameda Street Bridge and Alameda Street Bridge to Isleta Pueblo Boundary) during the dry season sampling event.

The COA continues its work to reduce e-coli loads through the pet waste education and outreach program. Dog waste had been estimated to contribute about 22% of the bacteria to the MS4 in a previous bacterial source tracking (BST) study performed in 2004. It has also commissioned a new BST study at an estimated cost of $250,000. A Quality Assurance Program Plan (QAPP) and sampling and analysis plan (SAP) were prepared in FY17. Nine dry weather screening samples were collected at various locations in the Rio Grande in May 2018. Results from this sampling event are preliminary and will be included in a future report.

Finally, the Middle Rio Grande Storm Water Quality Team (MRGSWQT), of which the COA is a member, funded an additional year of dry weather E.coli data collection by college students as part of the Bosque Ecosystem Monitoring Program (BEMP) to better understand the baseline concentration of E.coli prior to storm events. The MRGSWQT also funded a master student's thesis that studied the variability of E.coli concentrations in a water column compared to the juxtaposed sediment.

b(i)(e)A,C,D,E: The COA continues to work with the Albuquerque Bernalillo County Water Utility Authority (WUA) to make improvements to its pump and lift stations. The COA repaired one residential cross connections that had been illegally discharging to the storm drain system in FY18. A map showing the location of the repaired cross connection is included in Attachment 3.

b(i)(e)C: The Environmental Health Department continues to work with restaurants to reduce waste sources of bacteria from grease traps.

b(i)(e)D. The storm drainage department continues to work with BioPark staff in an effort to ensure that bacteria from animal waste are not discharged to the MS4.

b(i)(e)E. The COA contributes funding to and participates as a founding member of the Storm Water Quality Team. The Team continues education and outreach efforts to educate residents on bacteria associated with pet waste. The COA also works with the WUA on education of the public with regards to proper oil and grease disposal. A brochure regarding the disposal of oil and grease was prepared on behalf of the Storm Water Quality Team by its public relations contractor and is included in Attachment 8. Education and Outreach and Public Involvement Activities b(iii)(c): The COA continues to work with Bernalillo County (BernCo) and the NM Department of Transportation (NMDOT) on a joint sampling program in the Tijeras Arroyo. A total maximum daily load for nutrients was approved by the Water Quality Control Commission on September 12, 2017. As a result the COA will begin to develop Best Management Practice (BMP) to minimize impacts, if any, due to potential contributions from the urbanized area that makes up about 1% of the watershed. In addition, during the late spring of FY18, the COA began to obtain the approval of a joint funding agreement (JFA) with the Ciudad Soil Water and Conservation District for the preparation of a Watershed Based Plan for the Upper Tijeras Arroyo. The JFA was signed in September 2018 and will be included in next year's Annual Report along with an update discussing work performed under the JFA.

The COA Open Space Department created a Tijeras Arroyo Bio-Zone Resource Management Plan for a 3.7 mile stretch of the arroyo along Tijeras Creek in 2014 with a goal of conserving native vegetation and wildlife habitat and restoring vegetation and wildlife where feasible. The COA is actively working on purchasing two large plots (about 46 acres) in the arroyo for this purpose.

3. Endangered Species Act (ESA) Requirements

a(i) AMAFCA has filled in the former embayment reducing the potential for low DO waters to occur and subsequently discharge from the North Diversion Channel (NDC) to the Rio Grande. The COA continues to install water quality features, such as trash racks and water quality manholes in efforts to collect and reduce trash and debris that contribute to the DO problem.

a(ii) AMAFCA has submitted a revised strategy for reduction of pollutants contributed by the embayment. As stated above, the embayment has been filled in. Annual Incident Take Reports are submitted by AMAFCA to the EPA and Fish and Wildlife Service (FWS).

b(i) See also item 1.e. The COA performed two Sediment Assessment Studies that included an analysis of PCBs and SPLP metals in soils. The first, finalized in October 2016 assessed sediments from 5 major outfall locations. The second, completed in July 2017, further examined potential upstream sources, if any. No PCBs were reported. Metals in general, with the exceptions of Aluminum (Al) and Zinc (Zn) were present at concentrations below detection limits. Detected Al concentrations ranged from 1.9 to 11 mg/L. Detected Zn concentrations ranged from 0.022 to 0.048 mg/L. The Phase II assessment is provided in Attachment 1. The Phase I Assessment was included in last year's Annual report.

<u>I.D. Stormwater Management Program (SWMP)</u>

A copy of the updated SWMP adapted for compliance under NMR04A000 was included with the first full Annual Report on December 1, 2016. A future update will be available on December 1, 2019, the "Year 4" Annual Report. The SWMP is available on the COA's DMD MS4 webpage. Copies are also available on compact disks that will be mailed to regulators, stakeholders, and others upon request.

5b. Post-Construction Stormwater Management in New Development and Redevelopment .

(i)(c) Fourteen structural stormwater quality features have been installed since the WBP effective date of December 22, 2014. A listing, map, and description of these features is included in Attachment 4.

(ii)(b) An ordinance increasing the volume of capture of the 80th and 90th percentile storm events and supplying provisions for inspection of post construction stormwater controls and enforcement to ensure compliance was introduced to City Council on January 3, 2018, passed on September 17, 2018, and sent to the Mayor for signature on September 25, 2018. Click on the following link for an electronic copy of the ordinance.

https://cabq.legistar.com/LegislationDetail.aspx?ID=3301114&GUID=CE7540BE-83FF-40DD-B072-CC5E5751E003

(vi) Approximately 270 acres of impervious area (IA) was added to the Albuquerque Metropolitan area in FY18. Of this area, roughly 36% or 97 acres occurred in residential areas with walled backyards and is considered to be disconnected. Therefore the directly connected impervious area (DCIA) added in FY16 was 270 acres minus 97 acres for a total of 163 acres. The methodology for estimating impervious area is based on land use codes and was sent to EPA in its 2013 Annual report under the former Phase 1 permit NMS000101.

(vii) The COA's Master Drainage Plan provides a ranking of MS4-owned properties for flood control projects including retrofits.

5d. Industrial and High Risk Runoff

(vi) In FY18, 1517 inspections of facilities that require a Multi Sector General Permit (MSGP) were performed. Of these, on-call contractors inspected 55 sites while COA inspectors (1 supervisor and 3 inspectors) conducted 1462 inspections.

5e. Illicit Discharges and Improper Disposal

(i)e The COA implemented a 311 complaint system to report illicit discharges in the mid-2000s. See Attachment 5 for a map showing the locations of discharges and associated inspection forms reported via this system in FY2017.

(iv)A,C The Storm Drainage Section of the Department of Municipal Development (DMD) coordinated with the Solid Waste Department to host two Household Hazardous Waste recycling events in FY2018. More than eight hundred people participated in the 2 events, held in August 2017 and April 2018 during which approximately 50,000 pounds of materials were collected. In addition, over 9,500 COA residents disposed of roughly 425,000 pounds of hazardous materials at the collection facility during FY18 at a cost of $776,200. Of these materials, over 350,000 pounds or 82 percent were recycled.

(vii) In addition to utilizing the 311 complaint system to pinpoint illicit discharges, the COA implemented an Illicit Discharge Detection and Elimination (IDDE) inspection program in FY16 in order to mitigate the influence of discharges with lower risk but higher likelihood of occurrence. A local environmental firm was hired to supply staff to perform these inspections. Contractors performed 281 IDDE inspections in FY2018. Of these, 124 were in the automotive sector. The COA hired an inspector supervisor and 3 inspectors as permanent employees in FY17 to assist in IDDE inspection and data tracking efforts in future years.

5f. Control of Floatables Discharges

(iii). Street Sweeping crews picked up 6100 cubic yards (5600 tons) of dirt and debris from 43,000 miles of COA Right of Way in FY18. Dirt comprises about 65% of the material picked up by street sweepers with debris making up the remaining 35%. Of the debris, roughly 70% is vegetation. The remaining waste is comprised of plastics (bottles, bags, containers/lids) at 15%, paper and cardboard at 10% and metal at 5%.

In addition, Arroyo Maintenance cleaned 4400 cubic yards of dirt, trash, debris, and vegetation from the storm drain system during FY18.

<u>III.A. Monitoring and Assessment</u>

1. Wet Weather Reporting: The COA participates in the Middle Rio Grande monitoring cooperative. During FY16, the monitoring cooperative, of which the COA is a part, prepared a sampling and analysis plan which was submitted to EPA Region 6 in June 2016 for approval. Permit requirements call for the submission of 7 samples by the end of the permit term. In FY18, the monitoring cooperative collected two samples during the wet season and none during the dry season. The sampling results and a short discussion are provided in a letter report included in Attachment 2. As required in Sections D.1 and D.2, the monitoring results were submitted in the NetDMR system and hard copies and are provided in Attachment 2. Attachment 2 also includes the TMDL calculations and results.

2. Dry Weather Reporting: Dry weather screening is performed at 37 locations (25 direct discharge points to the Rio Grande and an additional 12 locations to assess subwatersheds). See Attachment 6 for results.

3. Floatables Reporting: See item 5f above. In addition an estimated 20 cubic yards of floatables were removed from the Barelas Pump Station in FY2018, the COA's selected floatables monitoring location. AMAFCA provides the information on floatables monitoring in the NDC.

4. Industrial and High Risk Reporting: The COA's landfills are located outside of the MS4 and drain to the Rio Puerco rather than the Rio Grande. Nonetheless, the landfills are permitted under the federal MSGP.

4.b COA's transfer stations, solid waste station at Pino Yards, transit stations, and fueling facilities, all located within the MS4, are classed as sector P and require quarterly visual monitoring only. Because of sporadic localized events that often occur during evening, weekends and other non-work hours, it is often difficult to obtain results. Nonetheless quarterly visual inspections are completed when possible. See Attachment 7 for the visual monitoring results.

ADDITIONAL INFORMATION TO SUPPLEMENT REPORT FORM

Item 3. Public Participation and Education

C. The COA Storm Drainage staff participate in and contribute $48,000 in dues to the MRGSWQT. Outreach activities performed by the 9 agencies that comprise the MRGSWQT are provided in the Outcomes Report in Attachment 8.

In addition, COA Parks and Recreation and Open Space staff led clean up events at six open space locations in the spring of 2018. During these events, 248 volunteers removed over 200 pounds of dog waste; 34 bags of trash and mixed recycling; and 105 gallons of glass from trails. Staff members also planted over 1200 cottonwood and 300 shrubs in the bosque with the help of 1166 youth and 345 adults during FY18.

The Storm Drainage Section also provided monetary support to The Nature Conservancy ($40,000) and Earth Force ($20,000) in their efforts to promote public education in the schools and in the adult community in the area of watershed health.

Item 5. Illicit Discharges

C. There are 25 discharge points to the Rio Grande. Assessment of industrial and commercial development within subwatersheds of the Albuquerque Metropolitan area as led to the selection of 12 additional dry weather screening locations. In total, 37 locations have been selected for dry weather screening. See Attachment 5, Dry Weather Screening for the results.

J. During the reporting period from July 1, 2017 through June 30, 2018, 98 improper discharge related complaints were reported to the 311 system and investigated by a City storm drainage engineer. See Attachment 3 for a map indicating location of discharge. During this time period 1 cross connection into the storm drain was repaired.

The COA notified the New Mexico Environment Department (NMED) on December 12, 2017 of illicit discharges that had occurred at the Daytona Transit facility from 2014 to 2016 during washing activities. Although the volume of the discharge is unknown, an estimated volume based on tank capacities yields a potential discharge of 733,200 gallons. A sampling and analysis plan was submitted to NMED on March 16, 2018 to characterize the presence of absence of contaminants in the stormwater system at the facility. Following sampling efforts in late March 2018 and subsequent analysis of samples, a report was submitted to NMED in May 2018. Both the Sampling and Analysis Plan (SAP) and a letter report that summarizes the results of the sampling are included in Attachment 9.

The Transit facility received an Administrative Order (AO) dated June 4, 2018 for failure to update the Storm Water Pollution Prevention Plan and site map; for failure to prevent unauthorized discharges; and for failure to practice good housekeeping measures to prevent contamination of storm water runoff. Transit facility staff have been in communication with EPA region enforcement personnel to resolve the AO.

Item 8. Program Resources

D. 27 full time employees that perform work related to the COA's MS4 include: 19 Arroyo/Storm Drainage Maintenance personnel, 8 Storm Drainage personnel (manager, 3 engineers, 1 supervisor inspector, and 3 inspectors), and 1 Stormwater Quality Engineer in Planning.

This 27 does not include 76 FTE's and 80 full time contractor positions in the Clean City Solid Waste program which picks up trash and floatables nor 25 employees in Street Maintenance that perform street sweeping. This also does not include Parks and Open Space personnel who perform restoration projects, host citizen clean up days, and perform education and outreach.

In addition to FTE's employed by the COA, the Department of Municipal Development, Storm Drainage Section budgets and spends approximately $600,000 per year on consultants hired solely to perform NPDES permit compliance tasks. This is the equivalent of 6 FTE's.

Attachment 1

City of Albuquerque Sediment Assessment

Phase II

July 10, 2017

Kathy Verhage
City of Albuquerque
Department of Municipal Development, Storm Drainage Design
P.O. Box 1293
Room 301
Albuquerque, New Mexico 87103

Re: Results of Sediment Sampling for PCBs and Metals along Stormwater Channels, Sediment Outfalls, and Upgradient Arroyo Locations, Albuquerque New Mexico

Dear Ms. Verhage:

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this letter report for submittal to the City of Albuquerque (COA or the City) summarizing the sampling event to characterize the presence or absence of near-surface polychlorinated biphenyl (PCB) congeners and metal concentrations in sediment along stormwater channels and outfalls within the Albuquerque metropolitan area. DBS&A personnel conducted the sediment sampling upstream of the concrete-lined areas and in erosion control structures where sediment accumulates and would be in contact during discharge events with stormwater that potentially reaches the Rio Grande. The sampling effort included the collection of background sediment samples from natural arroyo locations upgradient of urbanized development. Pertinent background information, sample locations and collection methods, sample handling and analysis procedures, and reporting information were described in the November 2016 sampling plan.

Background

The City and Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) screen sediments for PCBs at their outfalls as required by the former Albuquerque Metropolitan Area Permit NMS000101 (2012) and the Watershed Based Permit (WBP) NMR04A000 (2014). The City has focused its efforts on the San Jose Drain and Tijeras Arroyo, while AMAFCA continues to conduct soil screening in arroyos that contribute to the North Diversion Channel (NDC). Past soil screening reports include those conducted along the San Jose Drain in 2012 (COA), the Tijeras Arroyo in 2013 (COA), the NDC in 2014 (AMAFCA), and North Camino Channel and the Grant Line Channel in 2016 (AMAFCA).

The purpose of the 2017 sampling event was to determine the presence or absence of near-surface PCBs and metal concentrations in sediment along the Tijeras Arroyo and other channels within the Albuquerque metropolitan area as required by Part 1C-special conditions of the WBP. The sediment sample locations were determined based on a visual screening that focused on areas of sediment deposition (e.g., areas behind erosion control structures and

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

areas of low flow velocities) or from areas that potentially contribute sediment during stormwater events to the Rio Grande. For comparison purposes, representative background sediment samples were collected from natural arroyo channels located upgradient of urbanized development.

Sample Collection

Sediment samples for PCB and metals analyses were collected at 12 locations (Figure 1 and Table 1) from channels, arroyos, and sediment outfalls maintained by AMAFCA. A total of 5 of these locations represented background samples collected from natural arroyos upgradient of urbanized development. Following field reconnaissance and discussion with AMAFCA, a sediment sample was not collected at the Alameda Drain location noted in the sampling and analysis plan (SAP). It was determined that the Alameda Drain does not discharge to the Rio Grande.

Sediment samples were collected at or immediately below ground surface, and were stored in sealed containers on ice until delivered to the analytical laboratory with full chain of custody documentation. Photographs and global positioning system coordinates (Table 1) of the sample locations were taken during the sampling event, and the surrounding land use was noted. Photographs of the sample locations are provided in Attachment 1.

Sample Analysis

All samples were submitted to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico for analysis of PCBs and selected metals using U.S. Environmental Protection Agency (EPA) methods 8082 and 6010B, respectively. A synthetic precipitation leaching procedure (SPLP) was conducted on the sediment samples to determine the mobility of aluminum, cadmium, chromium, lead, nickel, and zinc. The SPLP simulates exposure of the sediment to rainfall, and is useful in estimating the leaching potential of metals moving from sediment into stormwater.

Sample Location Descriptions

Land use near the sample locations within the study area varies from industrial, undeveloped grass lands to publicly accessible open space properties (Table 1). Sampling locations in the North and South Diversion Channels were selected as close to the outfall to the Rio Grande as possible. Background sampling locations were selected in natural arroyos away from development. The sediment sample locations are described in the following subsections.

Tijeras Arroyo Sampling Location

The Tijeras Arroyo sampling location is located in the unlined section of the arroyo approximately 600 feet before the arroyo becomes concrete-lined, and is upstream of the automobile salvage yards located on Broadway. Upstream of the Tijeras Arroyo sampling to the east is Interstate 25 (I-25). Runoff from I-25 feeds into Tijeras Arroyo upgradient of the sampling location.

South Diversion Sampling Location

This sampling location is downstream of the South Diversion Channel where it crosses Murray Road SE. The sampling location is located in the unlined section of the arroyo approximately 800 feet before the arroyo becomes concrete-lined. The surrounding land use is primarily industrial.

San Jose Sampling Location

The sampling location for San Jose Drain is located along Route 303 in a natural channel approximately 900 feet before the channel enters the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) wastewater treatment plant property and eventually the Rio Grande. The drain is located next to agricultural land to the west and Route 303 and railroad thruway to the east. Land use upstream of the sampling location is a mixture of industrial and urban development.

West I-40 Sampling Location

The sampling location for the West I-40 Diversion Channel is located beneath the I-40 Rio Grande overpass at the terminus where the lined channel discharges into the Rio Grande. Land use upstream of the sampling location is a mixture of industrial and urban development. Evidence of recent vandalism and human habitation was observed in the sampling area.

San Antonio Arroyo Sampling Location

The sampling location for San Antonio Arroyo is located in the Rio Grande Bosque at the terminus where the lined channel discharges into the Rio Grande. Several small sand and gravel sand bars were present in the lined channel above the terminus. Material from the sand bars and arroyo terminus were collected for sampling. Directly upstream of the sample location, several sediment holding basins capture runoff before discharging to the lined arroyo. The holding basins were filled with water at the time of sampling. Land use upstream of the sampling location is a mixture of commercial and urban development.

Calabacillas Arroyo Sampling Location

The sampling location for Calabacillas Arroyo is located in the Rio Grande Bosque Park approximately 200 feet above the terminus where the natural channel discharges into the Rio Grande. Land use upstream of the sampling location is a mixture of commercial and urban development.

North Diversion Channel Sampling Location

The sampling location for the NDC is located approximately 1,200 feet upstream of where the lined channel discharges into the Rio Grande, directly behind the newly constructed AMAFCA equipment crossing. The sample was collected approximately 30 feet behind the crossing, in the middle of the channel. The majority of the natural channel behind the equipment crossing at the time of sampling was submerged. The left bank downstream of the railroad crossing bridge did have sediment accessible for sampling, but it appeared to be additional fill material, and trash has been dumped at the location. Land use upstream of the sampling location is a mixture of industrial and urban development.

Domingo Baca Arroyo

The location for the Domingo Baca Arroyo background sample is in the Far Northeast Heights of Albuquerque, near the City's boundary with the Sandia National Forest. The sample was collected in a natural arroyo that drains into the South Domingo Baca Channel, which eventually drains into the NDC. The sample was collected approximately 30 feet east of Bighorn Ridge Drive NE, upstream of urban development. Access farther up the arroyo, closer to the City boundary, was hampered by private property boundaries.

Embudo Arroyo

The location for the Embudo Arroyo background sample is in the Northeast Heights of Albuquerque, in the COA Sandia Foothills Open Space. The sample was collected in a natural arroyo that drains into the lined Embudo Arroyo, then the I-40 channel and eventually the NDC. The sample was collected approximately 4,000 feet upstream of the lined channel located near Monte Largo Drive NE.

Four Hills Arroyo

The location for the Four Hills Arroyo background sample is in the Far Southeast Heights of Albuquerque, near the City's boundary with Kirtland Air Force Base (AFB). The sample was collected in a natural arroyo directly above the lined Four Hills Arroyo, which eventually becomes the Tijeras Channel. Access farther up the arroyo, closer to the City boundary, was hampered by Kirtland AFB security fences.

Shamrock Channel

The location for the Shamrock Channel background sample is on Albuquerque's West Mesa, near Central Avenue and I-40. The sample was collected in a natural arroyo located in an undeveloped grassland area that drains directly to the West I-40 Channel. The Shamrock Foods Corporation and several trucking companies are located directly downstream.

North Boca Negra Arroyo

The location for the North Boca Negra Arroyo background sample is on Albuquerque's West Mesa, just east of Atrisco Vista Blvd, near the western extent of Paseo del Norte Boulevard. The sample was collected in a natural arroyo located in an undeveloped grassland area that drains directly to the Boca Negra Arroyo.

Results of Laboratory Analysis

The sediment samples were analyzed by HEAL for PCBs and selected metals using EPA methods 8082 and 6010B, respectively. The results of the laboratory analysis are presented in Table 2. Complete laboratory reports are provided as Attachment 2. For comparison purposes, the background locations have been listed in Table 2 just above the downstream sample locations. The detection limits ranged from 0.019 to 0.2 milligrams per kilogram (mg/kg) for the six aroclors analyzed. No PCBs were present in any of the sediment samples at concentrations above these detection limits.

As mentioned above, the SPLP was conducted on the sediment samples to determine the potential release of metals from the sediment into stormwater. Of the six metals analyzed, only aluminum and zinc were detected in the sediment sample leachate. Cadmium, chromium, lead, and nickel concentrations were below the detection limits, which ranged from 0.002 to 5 milligrams per liter (mg/L).

Detected aluminum concentrations ranged from 2.4 to 9.2 mg/L in the background samples and 1.9 to 11 mg/L in the downstream outfall, channel, and arroyo samples. Zinc concentrations were above the detection limits at the Four Hills and Domingo Baca background sample locations only. Detected zinc concentrations ranged from 0.022 to 0.048 mg/L in the downstream outfall, channel, and arroyo samples. The highest concentrations of aluminum (11 mg/L) and zinc (0.048 mg/L) were detected in the San Jose Drain sediment sample leachate.

Conclusions

Review of the laboratory analytical data indicates that there are no PCBs present at detectable concentrations in the sediment samples collected along stormwater channels and outfalls within the Albuquerque metropolitan area. Aluminum and zinc were detected in the sediment sample leachate, and may be contributing to stormwater concentrations for these metals.

We appreciate the opportunity to serve COA on this important project. If you have any questions regarding this sediment sampling report, please call me at (505) 822-9400.

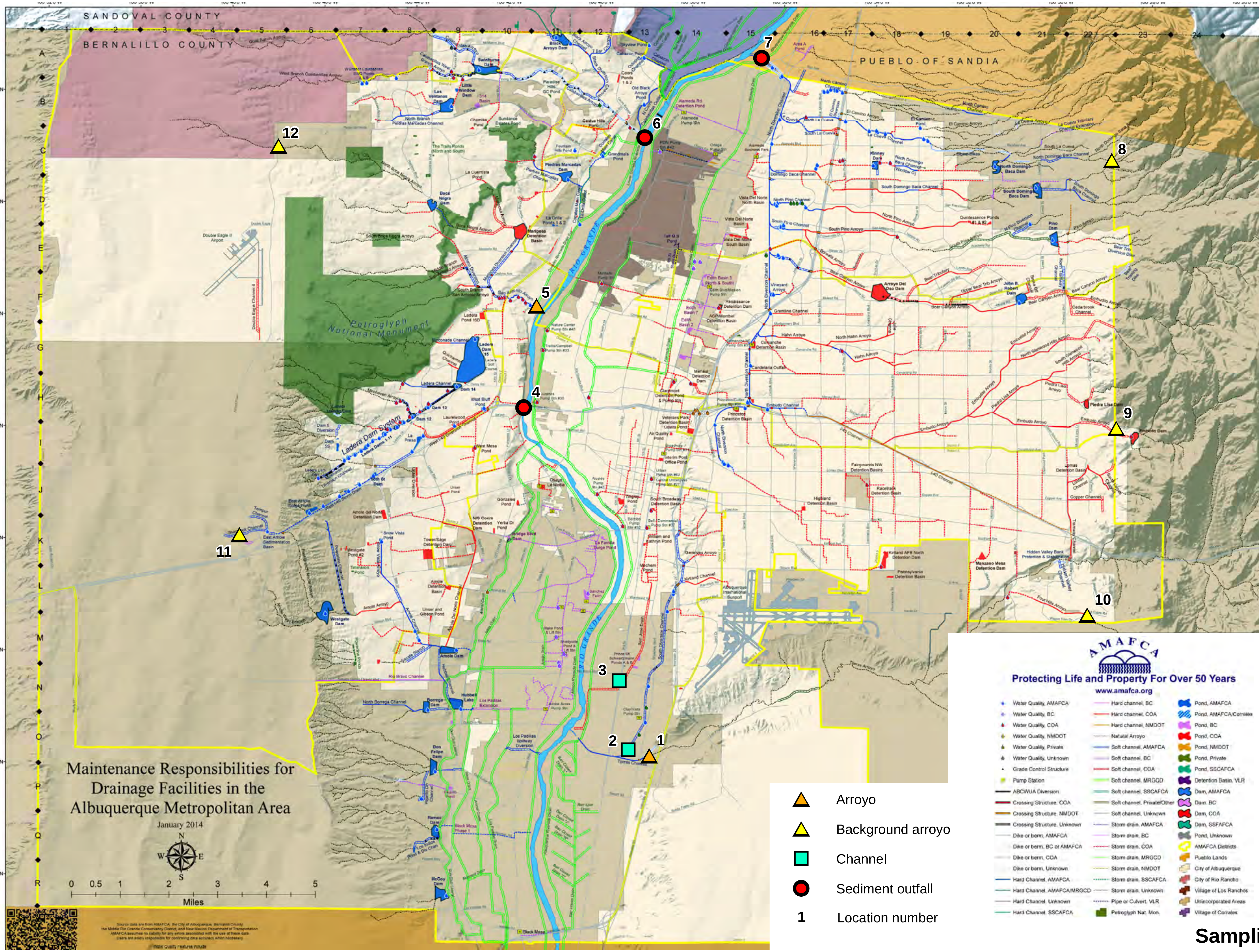
Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Chad Johannesen
Hydrogeologist

CJ/rpf
Attachments

Figure



Sampling Locations

Figure 1

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Tables

Table 1. Sample Locations

Location Number	Location Name	Location Type	Surrounding Land Use	Sample Date	Sample Name	UTM Coordinates (13 South)	
						X	Y
1	Tijeras Arroyo	Arroyo	Undeveloped, heavy equipment/ construction in area, evidence of off-road vehicular traffic	1/4/2017	Tijeras_Arroyo_010417	349611	3874573
2	South Diversion Channel	Channel	Industrial complexes	1/4/2017	SDC_010417	348923	3874776
3	San Jose Drain	Channel	Agricultural to west, Route 303 and railway to east	1/4/2017	San_Jose_010417	348653	3877060
4	West I-40 Diversion Channel	Sediment outfall	Urban development, below I-40 highway overpass	1/4/2017	WestI40DC_010417	345614	3886122
5	San Antonio Arroyo	Arroyo	Urban development, Rio Grande Bosque	1/4/2017	SanAntonio_010417	346083	3889473
6	Calabacillas Arroyo	Sediment outfall	Urban development, Rio Grande Bosque	1/5/2017	Calabacillas_010517	349730	3894981
7	North Diversion Channel	Sediment outfall	Urban development, Rio Grande Bosque	1/5/2017	NDC_EQPX_010517	353615	3897560
8	Domingo Baca Arroyo	Background arroyo	Undeveloped, homes located directly downstream	1/10/2017	DomingoBaca_011017	365124	3894029
9	Embudo Arroyo	Background arroyo	Undeveloped, hiking and recreational area	1/10/2017	Embudo_011017	365164	3885183
10	Four Hills Arroyo	Background arroyo	Undeveloped, homes located directly downstream	1/10/2017	Fourhills_011017	364128	3879035
11	Shamrock Channel	Background arroyo	Undeveloped grasslands	1/4/2017	Shamrock_010417	336177	3882048
12	North Boca Negra Arroyo	Background arroyo	Undeveloped grasslands, Atrisco Vista Blvd to west	1/5/2017	NorthBoca_010517	337634	3894860

Table 2. Sediment Analytical Results

Location Name	Location Type	PCBs (EPA Method 8082) (mg/kg)								SPLP Metals (EPA Method 6010B) (mg/L)					
		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs	Aluminum	Cadmium	Chromium	Lead	Nickel	Zinc
Four Hills Arroyo	Background arroyo	<0.02	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.6	<0.002	<0.006	<0.005	<0.01	0.022
Tijeras Arroyo	Arroyo	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	8.6	<1.0	<5.0	<5.0	<0.01	0.022
South Diversion Channel	Channel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	4.8	<1.0	<5.0	<5.0	<0.01	0.024
San Jose Drain	Channel	<0.02	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	11	<1.0	<5.0	<5.0	<0.01	0.048
Shamrock Channel	Background arroyo	<0.02	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	2.4	<1.0	<5.0	<5.0	<0.01	<0.02
West 1-40 Diversion Channel	Sediment outfall	<0.02	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	5.1	<1.0	<5.0	<5.0	<0.01	0.038
North Boca Negra Arroyo	Background arroyo	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	9.2	<1.0	<5.0	<5.0	<0.01	<0.02
San Antonio Arroyo	Arroyo	<0.02	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	2.8	<1.0	<5.0	<5.0	<0.01	<0.02
Calabacillas Arroyo	Sediment outfall	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.9	<1.0	<5.0	<5.0	<0.01	<0.02
Embudo Arroyo	Background arroyo	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	3.7	<0.002	<0.006	<0.005	<0.01	<0.02
Domingo Baca Arroyo	Background arroyo	<0.02	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	8.0	<0.002	<0.006	<0.005	<0.01	0.030
North Diversion Channel	Sediment outfall	<0.02	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	4.9	<1.0	<5.0	<5.0	<0.01	0.030

PCBs = Polychlorinated biphenyls
EPA = U.S. Environmental Protection Agency
mg/kg = Milligrams per kilogram
SPLP = Synthetic precipitation leaching procedure
mg/L = Milligrams per liter

Attachment 1

Photographs

1. Tijeras Arroyo sample location, view to east

2. South Diversion Channel sample location, view to north

3. San Jose Drain sample location, view to west with sample location noted

4. San Jose Drain sample location, view to north

5. West I-40 Diversion Channel sampling location, view to east with sample location noted.

6. West I-40 Diversion Channel sampling location, view to north

7. San Antonio Arroyo sampling location, view to east

8. San Antonio Arroyo sampling location, view to west with sample location noted

9. San Antonio Arroyo sampling location: Sand-gravel bar located upstream of channel terminus, view to east

10. Calabacillas Arroyo sampling location, view to west

11. North Diversion Channel sampling location, view to east

12. Domingo Baca Arroyo sampling location, view to east

13. Embudo Arroyo sampling location, view to east

14. Four Hills sampling location, view to northeast with sample location noted

15. Shamrock Channel sampling location, view to west

16. North Boca Negra sampling location, view to east

Attachment 2

Laboratory Reports

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 24, 2017

Chad Johannesen
DBS
6020 Academy NE Suite 100
Albuquerque, NM 87109
TEL: (505) 822-9400
FAX (505) 822-8877

RE: PCB Sediment Sampling   OrderNo.: 1701235

Dear Chad Johannesen:

Hall Environmental Analysis Laboratory received 18 sample(s) on 1/6/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1701235**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **1/24/2017**

CLIENT: DBS **Client Sample ID:** Tijeras-Arroyo-010417
Project: PCB Sediment Sampling **Collection Date:** 1/4/2017 10:30:00 AM
Lab ID: 1701235-001 **Matrix:** SOIL **Received Date:** 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst:	**SCC**
Aroclor 1016	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Aroclor 1221	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Aroclor 1232	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Aroclor 1242	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Aroclor 1248	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Aroclor 1254	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Aroclor 1260	ND	0.020		mg/Kg	1	1/16/2017 9:25:00 AM	29659
Surr: Decachlorobiphenyl	80.4	19.7-141		%Rec	1	1/16/2017 9:25:00 AM	29659
Surr: Tetrachloro-m-xylene	94.0	18.5-136		%Rec	1	1/16/2017 9:25:00 AM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Analytical Report
Lab Order **1701235**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **1/24/2017**

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-002 **Matrix:** SOIL

Client Sample ID: SDC-010417
Collection Date: 1/4/2017 11:15:00 AM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst: **SCC**	
Aroclor 1016	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Aroclor 1221	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Aroclor 1232	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Aroclor 1242	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Aroclor 1248	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Aroclor 1254	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Aroclor 1260	ND	0.020		mg/Kg	1	1/16/2017 9:58:00 AM	29659
Surr: Decachlorobiphenyl	63.6	19.7-141		%Rec	1	1/16/2017 9:58:00 AM	29659
Surr: Tetrachloro-m-xylene	69.2	18.5-136		%Rec	1	1/16/2017 9:58:00 AM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-003
Matrix: SOIL
Client Sample ID: San-Jose-010417
Collection Date: 1/4/2017 11:45:00 AM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst: **SCC**	
Aroclor 1016	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Aroclor 1221	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Aroclor 1232	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Aroclor 1242	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Aroclor 1248	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Aroclor 1254	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Aroclor 1260	ND	0.20	D	mg/Kg	1	1/16/2017 11:56:00 AM	29659
Surr: Decachlorobiphenyl	0	19.7-141	SD	%Rec	1	1/16/2017 11:56:00 AM	29659
Surr: Tetrachloro-m-xylene	0	18.5-136	SD	%Rec	1	1/16/2017 11:56:00 AM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-004
Matrix: SOIL
Client Sample ID: West I40 DC-010417
Collection Date: 1/4/2017 1:45:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S							Analyst: **SCC**
Aroclor 1016	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Aroclor 1221	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Aroclor 1232	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Aroclor 1242	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Aroclor 1248	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Aroclor 1254	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Aroclor 1260	ND	0.19	D	mg/Kg	1	1/16/2017 12:29:00 PM	29659
Surr: Decachlorobiphenyl	0	19.7-141	SD	%Rec	1	1/16/2017 12:29:00 PM	29659
Surr: Tetrachloro-m-xylene	0	18.5-136	SD	%Rec	1	1/16/2017 12:29:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Analytical Report
Lab Order **1701235**
Date Reported: **1/24/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS | **Client Sample ID:** Shamrock-010417
Project: PCB Sediment Sampling | **Collection Date:** 1/4/2017 2:30:00 PM
Lab ID: 1701235-005 | **Matrix:** SOIL | **Received Date:** 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst: **SCC**	
Aroclor 1016	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Aroclor 1221	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Aroclor 1232	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Aroclor 1242	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Aroclor 1248	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Aroclor 1254	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Aroclor 1260	ND	0.019		mg/Kg	1	1/16/2017 1:02:00 PM	29659
Surr: Decachlorobiphenyl	81.2	19.7-141		%Rec	1	1/16/2017 1:02:00 PM	29659
Surr: Tetrachloro-m-xylene	88.0	18.5-136		%Rec	1	1/16/2017 1:02:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS | **Client Sample ID:** San Antonio-010417
Project: PCB Sediment Sampling | **Collection Date:** 1/4/2017 3:00:00 PM
Lab ID: 1701235-006 | **Matrix:** SOIL | **Received Date:** 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst: **SCC**	
Aroclor 1016	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Aroclor 1221	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Aroclor 1232	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Aroclor 1242	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Aroclor 1248	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Aroclor 1254	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Aroclor 1260	ND	0.19	D	mg/Kg	1	1/16/2017 1:35:00 PM	29659
Surr: Decachlorobiphenyl	0	19.7-141	SD	%Rec	1	1/16/2017 1:35:00 PM	29659
Surr: Tetrachloro-m-xylene	0	18.5-136	SD	%Rec	1	1/16/2017 1:35:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-007 **Matrix:** SOIL

Client Sample ID: Calabacillas-010517
Collection Date: 1/5/2017 2:00:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst:	**SCC**
Aroclor 1016	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Aroclor 1221	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Aroclor 1232	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Aroclor 1242	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Aroclor 1248	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Aroclor 1254	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Aroclor 1260	ND	0.020		mg/Kg	1	1/16/2017 2:08:00 PM	29659
Surr: Decachlorobiphenyl	84.8	19.7-141		%Rec	1	1/16/2017 2:08:00 PM	29659
Surr: Tetrachloro-m-xylene	88.4	18.5-136		%Rec	1	1/16/2017 2:08:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-008 **Matrix:** SOIL

Client Sample ID: NDC-EQPX-010517
Collection Date: 1/5/2017 2:45:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S							Analyst: **SCC**
Aroclor 1016	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Aroclor 1221	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Aroclor 1232	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Aroclor 1242	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Aroclor 1248	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Aroclor 1254	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Aroclor 1260	ND	0.19	D	mg/Kg	1	1/16/2017 2:41:00 PM	29659
Surr: Decachlorobiphenyl	0	19.7-141	SD	%Rec	1	1/16/2017 2:41:00 PM	29659
Surr: Tetrachloro-m-xylene	0	18.5-136	SD	%Rec	1	1/16/2017 2:41:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-009 **Matrix:** SOIL

Client Sample ID: North Boca-010517
Collection Date: 1/5/2017 3:45:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst:	**SCC**
Aroclor 1016	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Aroclor 1221	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Aroclor 1232	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Aroclor 1242	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Aroclor 1248	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Aroclor 1254	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Aroclor 1260	ND	0.020		mg/Kg	1	1/16/2017 3:13:00 PM	29659
Surr: Decachlorobiphenyl	76.4	19.7-141		%Rec	1	1/16/2017 3:13:00 PM	29659
Surr: Tetrachloro-m-xylene	78.0	18.5-136		%Rec	1	1/16/2017 3:13:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS | **Client Sample ID:** Tijeras-Arroyo-010417
Project: PCB Sediment Sampling | **Collection Date:** 1/4/2017 10:30:00 AM
Lab ID: 1701235-010 | **Matrix:** LEACHATE | **Received Date:** 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS						Analyst: **pmf**	
Aluminum	8.6	0.10		mg/L	5	1/18/2017 4:02:04 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:14:48 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:14:48 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:14:48 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:14:48 PM	29670
Zinc	0.022	0.020		mg/L	1	1/18/2017 3:14:48 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-011 **Matrix:** LEACHATE

Client Sample ID: SDC-010417
Collection Date: 1/4/2017 11:15:00 AM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS							Analyst: **pmf**
Aluminum	4.8	0.10		mg/L	5	1/18/2017 4:03:35 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:16:18 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:16:18 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:16:18 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:16:18 PM	29670
Zinc	0.024	0.020		mg/L	1	1/18/2017 3:16:18 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS **Client Sample ID:** San-Jose-010417
Project: PCB Sediment Sampling **Collection Date:** 1/4/2017 11:45:00 AM
Lab ID: 1701235-012 **Matrix:** LEACHATE **Received Date:** 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS							Analyst: **pmf**
Aluminum	11	0.10		mg/L	5	1/18/2017 4:11:27 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:23:45 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:23:45 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:23:45 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:23:45 PM	29670
Zinc	0.048	0.020		mg/L	1	1/18/2017 3:23:45 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-013 **Matrix:** LEACHATE

Client Sample ID: West I40 DC-010417
Collection Date: 1/4/2017 1:45:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS						Analyst: **pmf**	
Aluminum	5.1	0.10		mg/L	5	1/18/2017 4:13:04 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:25:21 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:25:21 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:25:21 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:25:21 PM	29670
Zinc	0.038	0.020		mg/L	1	1/18/2017 3:25:21 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-014 **Matrix:** LEACHATE

Client Sample ID: Shamrock-010417
Collection Date: 1/4/2017 2:30:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS						Analyst: **pmf**	
Aluminum	2.4	0.020		mg/L	1	1/18/2017 3:26:59 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:26:59 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:26:59 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:26:59 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:26:59 PM	29670
Zinc	ND	0.020		mg/L	1	1/18/2017 3:26:59 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **1/24/2017**

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-015 **Matrix:** LEACHATE

Client Sample ID: San Antonio-010417
Collection Date: 1/4/2017 3:00:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS							Analyst: **pmf**
Aluminum	2.8	0.020		mg/L	1	1/18/2017 3:28:36 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:28:36 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:28:36 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:28:36 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:28:36 PM	29670
Zinc	ND	0.020		mg/L	1	1/18/2017 3:28:36 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **1/24/2017**

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-016 **Matrix:** LEACHATE

Client Sample ID: Calabacillas-010517
Collection Date: 1/5/2017 2:00:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS							Analyst: **pmf**
Aluminum	1.9	0.020		mg/L	1	1/18/2017 3:35:31 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:35:31 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:35:31 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:35:31 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:35:31 PM	29670
Zinc	ND	0.020		mg/L	1	1/18/2017 3:35:31 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-017 **Matrix:** LEACHATE

Client Sample ID: NDC-EQPX-010517
Collection Date: 1/5/2017 2:45:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS							Analyst: **pmf**
Aluminum	4.9	0.020		mg/L	1	1/18/2017 3:37:07 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:37:07 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:37:07 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:37:07 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:37:07 PM	29670
Zinc	0.030	0.020		mg/L	1	1/18/2017 3:37:07 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: DBS
Project: PCB Sediment Sampling
Lab ID: 1701235-018
Matrix: LEACHATE
Client Sample ID: North Boca-010517
Collection Date: 1/5/2017 3:45:00 PM
Received Date: 1/6/2017 1:50:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: SPLP METALS						Analyst: **pmf**	
Aluminum	9.2	0.10		mg/L	5	1/18/2017 4:14:53 PM	29670
Cadmium	ND	1.0		mg/L	1	1/18/2017 3:38:44 PM	29670
Chromium	ND	5.0		mg/L	1	1/18/2017 3:38:44 PM	29670
Lead	ND	5.0		mg/L	1	1/18/2017 3:38:44 PM	29670
Nickel	ND	0.010		mg/L	1	1/18/2017 3:38:44 PM	29670
Zinc	ND	0.020		mg/L	1	1/18/2017 3:38:44 PM	29670

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1701235**

24-Jan-17

Client: DBS

Project: PCB Sediment Sampling

Sample ID **MB-29659** SampType: **MBLK** TestCode: **EPA Method 8082: PCB's**
Client ID: **PBS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/16/2017** SeqNo: **1253839** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.020								
Aroclor 1221	ND	0.020								
Aroclor 1232	ND	0.020								
Aroclor 1242	ND	0.020								
Aroclor 1248	ND	0.020								
Aroclor 1254	ND	0.020								
Aroclor 1260	ND	0.020								
Surr: Decachlorobiphenyl	0.034		0.06250		54.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.034		0.06250		54.4	18.5	136			

Sample ID **LCS-29659** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/16/2017** SeqNo: **1253940** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	0.069	0.020	0.1250	0	55.0	22.1	258			
Aroclor 1260	0.059	0.020	0.1250	0	47.0	15	217			
Surr: Decachlorobiphenyl	0.036		0.06250		56.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.034		0.06250		54.8	18.5	136			

Sample ID **LCS-29659(1221)** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255028** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1221	0.096	0.020	0.1250	0	77.0	22.1	258			
Surr: Decachlorobiphenyl	0.048		0.06250		76.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.040		0.06250		64.4	18.5	136			

Sample ID **LCSD-29659(1221)** SampType: **LCSD** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS02** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255030** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1221	0.079	0.020	0.1250	0	63.2	22.1	258	19.7	22.6	
Surr: Decachlorobiphenyl	0.046		0.06250		73.2	19.7	141	0	0	
Surr: Tetrachloro-m-xylene	0.038		0.06250		60.4	18.5	136	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1701235**

Hall Environmental Analysis Laboratory, Inc.

24-Jan-17

Client: DBS
Project: PCB Sediment Sampling

Sample ID **LCS-29659(1232)** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255048** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1232	0.12	0.020	0.1250	0	97.4	22.1	258			
Surr: Decachlorobiphenyl	0.046		0.06250		73.6	19.7	141			
Surr: Tetrachloro-m-xylene	0.042		0.06250		67.2	18.5	136			

Sample ID **LCSD-29659(1232)** SampType: **LCSD** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS02** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255050** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1232	0.15	0.020	0.1250	0	121	22.1	258	21.6	22.6	
Surr: Decachlorobiphenyl	0.046		0.06250		73.6	19.7	141	0	0	
Surr: Tetrachloro-m-xylene	0.041		0.06250		65.6	18.5	136	0	0	

Sample ID **LCS-29659(1242)** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255051** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1242	0.092	0.020	0.1250	0	73.8	22.1	258			
Surr: Decachlorobiphenyl	0.036		0.06250		56.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.034		0.06250		54.0	18.5	136			

Sample ID **LCSD-29659(1242)** SampType: **LCSD** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS02** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255062** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1242	0.10	0.020	0.1250	0	83.0	22.1	258	11.7	22.6	
Surr: Decachlorobiphenyl	0.038		0.06250		61.6	19.7	141	0	0	
Surr: Tetrachloro-m-xylene	0.036		0.06250		58.0	18.5	136	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1701235**

24-Jan-17

Client: DBS

Project: PCB Sediment Sampling

Sample ID **MB-29670** SampType: **MBLK** TestCode: **EPA Method 6010B: SPLP Metals**

Client ID: **PBW** Batch ID: **29670** RunNo: **40134**

Prep Date: **1/12/2017** Analysis Date: **1/18/2017** SeqNo: **1258060** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Nickel	ND	0.010								
Zinc	ND	0.020								

Sample ID **LCS-29670** SampType: **LCS** TestCode: **EPA Method 6010B: SPLP Metals**

Client ID: **LCSW** Batch ID: **29670** RunNo: **40134**

Prep Date: **1/12/2017** Analysis Date: **1/18/2017** SeqNo: **1258061** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.56	0.020	0.5000	0	113	80	120			
Cadmium	ND	1.0	0.5000	0	101	80	120			
Chromium	ND	5.0	0.5000	0	98.7	80	120			
Lead	ND	5.0	0.5000	0	100	80	120			
Nickel	0.48	0.010	0.5000	0	96.7	80	120			
Zinc	0.48	0.020	0.5000	0	96.2	80	120			

Sample ID **1701235-015AMS** SampType: **MS** TestCode: **EPA Method 6010B: SPLP Metals**

Client ID: **San Antonio-010417** Batch ID: **29670** RunNo: **40134**

Prep Date: **1/12/2017** Analysis Date: **1/18/2017** SeqNo: **1258071** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	4.0	0.020	0.5000	2.759	251	75	125			S
Cadmium	ND	1.0	0.5000	0	97.9	75	125			
Chromium	ND	5.0	0.5000	0	96.5	75	125			
Lead	ND	5.0	0.5000	0	97.7	75	125			
Nickel	0.47	0.010	0.5000	0	94.8	75	125			
Zinc	0.48	0.020	0.5000	0	96.7	75	125			

Sample ID **1701235-015AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: SPLP Metals**

Client ID: **San Antonio-010417** Batch ID: **29670** RunNo: **40134**

Prep Date: **1/12/2017** Analysis Date: **1/18/2017** SeqNo: **1258072** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	4.0	0.020	0.5000	2.759	239	75	125	1.49	20	S
Cadmium	ND	1.0	0.5000	0	99.7	75	125	0	20	
Chromium	ND	5.0	0.5000	0	97.4	75	125	0	20	
Lead	ND	5.0	0.5000	0	97.9	75	125	0	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1701235**

24-Jan-17

Client: DBS

Project: PCB Sediment Sampling

Sample ID **1701235-015AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: SPLP Metals**

Client ID: **San Antonio-010417** Batch ID: **29670** RunNo: **40134**

Prep Date: **1/12/2017** Analysis Date: **1/18/2017** SeqNo: **1258072** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nickel	0.48	0.010	0.5000	0	95.7	75	125	0.934	20	
Zinc	0.50	0.020	0.5000	0	99.1	75	125	2.45	20	

Sample ID **1701235-015APS** SampType: **PS** TestCode: **EPA Method 6010B: SPLP Metals**

Client ID: **San Antonio-010417** Batch ID: **29670** RunNo: **40134**

Prep Date: Analysis Date: **1/18/2017** SeqNo: **1258073** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	3.6	0.020	0.5000	2.759	171	80	120			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: DBS   Work Order Number: 1701235   RcptNo: 1

Received by/date: AJ 01/06/17

Logged By: Anne Thorne   1/6/2017 1:50:00 PM   Anne Thorne

Completed By: Anne Thorne   1/9/2017 8:18:58 AM   Anne Thorne

Reviewed By: 01/09/17

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
(Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
(If no, notify customer for authorization.)

# of preserved bottles checked for pH: ______ (<2 or >12 unless noted)
Adjusted? ______
Checked by: ______

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ______ Date ______
By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ______
Client Instructions: ______

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.9	Good	Not Present			

Chain-of-Custody Record

Client: Daniel B Stephens

Mailing Address: 6020 Academy NE

ABQ, NM 87109

Phone #: 505-822-9400

email or Fax#: cjohannesen@dbstephens.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other ____________

☐ EDD (Type) ____________

Turn-Around Time:

☒ Standard ☐ Rush ____________

Project Name: PCB Sediment Sampling

Project #: WR14.0049.01.0000014

Project Manager: Chad Johannesen

Sampler: Chad Johannesen

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.9°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. A011016 1701235	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	PCB - 8082A (SW-846)	Metals - 6020A (aluminum,	cadmium, chromium, nickel,	lead and zinc)	Air Bubbles (Y or N)
~~1/17~~	~~1030~~																					
/17	1030	Soil	Tijeras_Arroyo_010417	2×8oz	—	leachate -010 -001												X	X			
↓	1115	↓	SDC_010417	↓	↓	-011 -002												X	X			
↓	1145	↓	San-Jose_010417	↓	↓	-012 -003												X	X			
↓	1345	↓	West I40DC_010417	↓	↓	-013 -004												X	X			
↓	1430	↓	Shamrock_010417	↓	↓	-014 -005												X	X			
↓	1500	↓	SanAntonio_010417	↓	↓	-015 -006												X	X			
/17	1400	↓	Calabacillas_010517	↓	↓	-016 -007												X	X			
↓	1445	↓	NDC_EQPX_010517	↓	↓	-017 -008												X	X			
↓	1545	↓	North Boca_010517	↓	↓	-018 -009												X	X			

Date:	Time:	Relinquished by:	Received by:	Date	Time
/17	1350	[signature]	[signature]	1/6/17	1350

Remarks: SPLP - Synthetic Precipitation leaching for metals

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 23, 2017

Chad Johannesen
Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109
TEL: (505) 822-9400
FAX (505) 822-8877

RE: PCB Sediment Sampling   OrderNo.: 1701387

Dear Chad Johannesen:

Hall Environmental Analysis Laboratory received 6 sample(s) on 1/10/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Domingo Baca-011017
Project: PCB Sediment Sampling **Collection Date:** 1/10/2017 12:15:00 PM
Lab ID: 1701387-001 **Matrix:** SOIL **Received Date:** 1/10/2017 2:35:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S						Analyst:	**SCC**
Aroclor 1016	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Aroclor 1221	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Aroclor 1232	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Aroclor 1242	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Aroclor 1248	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Aroclor 1254	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Aroclor 1260	ND	0.099	D	mg/Kg	1	1/16/2017 3:46:00 PM	29659
Surr: Decachlorobiphenyl	0	19.7-141	SD	%Rec	1	1/16/2017 3:46:00 PM	29659
Surr: Tetrachloro-m-xylene	0	18.5-136	SD	%Rec	1	1/16/2017 3:46:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Project: PCB Sediment Sampling
Lab ID: 1701387-002 **Matrix:** SOIL

Client Sample ID: Embudo-011017
Collection Date: 1/10/2017 1:00:00 PM
Received Date: 1/10/2017 2:35:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S							Analyst: **SCC**
Aroclor 1016	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Aroclor 1221	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Aroclor 1232	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Aroclor 1242	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Aroclor 1248	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Aroclor 1254	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Aroclor 1260	ND	0.020		mg/Kg	1	1/16/2017 4:19:00 PM	29659
Surr: Decachlorobiphenyl	94.8	19.7-141		%Rec	1	1/16/2017 4:19:00 PM	29659
Surr: Tetrachloro-m-xylene	101	18.5-136		%Rec	1	1/16/2017 4:19:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Project: PCB Sediment Sampling
Lab ID: 1701387-003 **Matrix:** SOIL

Client Sample ID: Fourhills-011017
Collection Date: 1/10/2017 2:00:00 PM
Received Date: 1/10/2017 2:35:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8082: PCB'S							Analyst: **SCC**
Aroclor 1016	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Aroclor 1221	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Aroclor 1232	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Aroclor 1242	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Aroclor 1248	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Aroclor 1254	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Aroclor 1260	ND	0.20	D	mg/Kg	1	1/16/2017 4:52:00 PM	29659
Surr: Decachlorobiphenyl	0	19.7-141	SD	%Rec	1	1/16/2017 4:52:00 PM	29659
Surr: Tetrachloro-m-xylene	0	18.5-136	SD	%Rec	1	1/16/2017 4:52:00 PM	29659

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Domingo Baca-011017
Project: PCB Sediment Sampling **Collection Date:** 1/10/2017 12:15:00 PM
Lab ID: 1701387-004 **Matrix:** LEACHATE **Received Date:** 1/10/2017 2:35:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **pmf**
Aluminum	8.0	0.20		mg/L	10	1/17/2017 6:53:21 PM	29691
Cadmium	ND	0.0020		mg/L	1	1/16/2017 8:05:33 PM	29691
Chromium	ND	0.0060		mg/L	1	1/16/2017 8:05:33 PM	29691
Lead	ND	0.0050		mg/L	1	1/16/2017 8:05:33 PM	29691
Nickel	ND	0.010		mg/L	1	1/16/2017 8:05:33 PM	29691
Zinc	0.030	0.020		mg/L	1	1/16/2017 8:05:33 PM	29691

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Project: PCB Sediment Sampling
Lab ID: 1701387-005 **Matrix:** LEACHATE

Client Sample ID: Embudo-011017
Collection Date: 1/10/2017 1:00:00 PM
Received Date: 1/10/2017 2:35:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **pmf**
Aluminum	3.7	0.10		mg/L	5	1/16/2017 8:09:46 PM	29691
Cadmium	ND	0.0020		mg/L	1	1/16/2017 8:08:28 PM	29691
Chromium	ND	0.0060		mg/L	1	1/16/2017 8:08:28 PM	29691
Lead	ND	0.0050		mg/L	1	1/16/2017 8:08:28 PM	29691
Nickel	ND	0.010		mg/L	1	1/16/2017 8:08:28 PM	29691
Zinc	ND	0.020		mg/L	1	1/16/2017 8:08:28 PM	29691

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Fourhills-011017
Project: PCB Sediment Sampling **Collection Date:** 1/10/2017 2:00:00 PM
Lab ID: 1701387-006 **Matrix:** LEACHATE **Received Date:** 1/10/2017 2:35:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **pmf**
Aluminum	3.6	0.10		mg/L	5	1/16/2017 8:17:35 PM	29691
Cadmium	ND	0.0020		mg/L	1	1/16/2017 8:16:13 PM	29691
Chromium	ND	0.0060		mg/L	1	1/16/2017 8:16:13 PM	29691
Lead	ND	0.0050		mg/L	1	1/16/2017 8:16:13 PM	29691
Nickel	ND	0.010		mg/L	1	1/16/2017 8:16:13 PM	29691
Zinc	0.022	0.020		mg/L	1	1/16/2017 8:16:13 PM	29691

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1701387**

23-Jan-17

Client: Daniel B. Stephens & Assoc.

Project: PCB Sediment Sampling

Sample ID **MB-29659** SampType: **MBLK** TestCode: **EPA Method 8082: PCB's**

Client ID: **PBS** Batch ID: **29659** RunNo: **40011**

Prep Date: **1/12/2017** Analysis Date: **1/16/2017** SeqNo: **1253839** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.020								
Aroclor 1221	ND	0.020								
Aroclor 1232	ND	0.020								
Aroclor 1242	ND	0.020								
Aroclor 1248	ND	0.020								
Aroclor 1254	ND	0.020								
Aroclor 1260	ND	0.020								
Surr: Decachlorobiphenyl	0.034		0.06250		54.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.034		0.06250		54.4	18.5	136			

Sample ID **LCS-29659** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**

Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**

Prep Date: **1/12/2017** Analysis Date: **1/16/2017** SeqNo: **1253940** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1016	0.069	0.020	0.1250	0	55.0	22.1	258			
Aroclor 1260	0.059	0.020	0.1250	0	47.0	15	217			
Surr: Decachlorobiphenyl	0.036		0.06250		56.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.034		0.06250		54.8	18.5	136			

Sample ID **LCS-29659(1221)** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**

Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**

Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255028** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1221	0.096	0.020	0.1250	0	77.0	22.1	258			
Surr: Decachlorobiphenyl	0.048		0.06250		76.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.040		0.06250		64.4	18.5	136			

Sample ID **LCSD-29659(1221)** SampType: **LCSD** TestCode: **EPA Method 8082: PCB's**

Client ID: **LCSS02** Batch ID: **29659** RunNo: **40011**

Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255030** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1221	0.079	0.020	0.1250	0	63.2	22.1	258	19.7	22.6	
Surr: Decachlorobiphenyl	0.046		0.06250		73.2	19.7	141	0	0	
Surr: Tetrachloro-m-xylene	0.038		0.06250		60.4	18.5	136	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1701387**

Hall Environmental Analysis Laboratory, Inc.

23-Jan-17

Client: Daniel B. Stephens & Assoc.

Project: PCB Sediment Sampling

Sample ID **LCS-29659(1232)** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255048** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1232	0.12	0.020	0.1250	0	97.4	22.1	258			
Surr: Decachlorobiphenyl	0.046		0.06250		73.6	19.7	141			
Surr: Tetrachloro-m-xylene	0.042		0.06250		67.2	18.5	136			

Sample ID **LCSD-29659(1232)** SampType: **LCSD** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS02** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255050** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1232	0.15	0.020	0.1250	0	121	22.1	258	21.6	22.6	
Surr: Decachlorobiphenyl	0.046		0.06250		73.6	19.7	141	0	0	
Surr: Tetrachloro-m-xylene	0.041		0.06250		65.6	18.5	136	0	0	

Sample ID **LCS-29659(1242)** SampType: **LCS** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255051** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1242	0.092	0.020	0.1250	0	73.8	22.1	258			
Surr: Decachlorobiphenyl	0.036		0.06250		56.8	19.7	141			
Surr: Tetrachloro-m-xylene	0.034		0.06250		54.0	18.5	136			

Sample ID **LCSD-29659(1242)** SampType: **LCSD** TestCode: **EPA Method 8082: PCB's**
Client ID: **LCSS02** Batch ID: **29659** RunNo: **40011**
Prep Date: **1/12/2017** Analysis Date: **1/17/2017** SeqNo: **1255062** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aroclor 1242	0.10	0.020	0.1250	0	83.0	22.1	258	11.7	22.6	
Surr: Decachlorobiphenyl	0.038		0.06250		61.6	19.7	141	0	0	
Surr: Tetrachloro-m-xylene	0.036		0.06250		58.0	18.5	136	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1701387**

23-Jan-17

Client: Daniel B. Stephens & Assoc.

Project: PCB Sediment Sampling

Sample ID **MB-29691** SampType: **MBLK** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **PBW** Batch ID: **29691** RunNo: **40089**

Prep Date: **1/13/2017** Analysis Date: **1/17/2017** SeqNo: **1256477** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Sample ID **LCS-29691** SampType: **LCS** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **LCSW** Batch ID: **29691** RunNo: **40089**

Prep Date: **1/13/2017** Analysis Date: **1/17/2017** SeqNo: **1256478** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.57	0.020	0.5000	0	115	80	120			

Sample ID **MB-29691** SampType: **MBLK** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **PBW** Batch ID: **29691** RunNo: **40062**

Prep Date: **1/13/2017** Analysis Date: **1/16/2017** SeqNo: **1259410** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.0050								
Nickel	ND	0.010								
Zinc	ND	0.020								

Sample ID **LCS-29691** SampType: **LCS** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **LCSW** Batch ID: **29691** RunNo: **40062**

Prep Date: **1/13/2017** Analysis Date: **1/16/2017** SeqNo: **1259411** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.57	0.020	0.5000	0	113	80	120			
Cadmium	0.50	0.0020	0.5000	0	99.6	80	120			
Chromium	0.51	0.0060	0.5000	0	102	80	120			
Lead	0.51	0.0050	0.5000	0	101	80	120			
Nickel	0.49	0.010	0.5000	0	98.5	80	120			
Zinc	0.49	0.020	0.5000	0	97.5	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: DBS   Work Order Number: 1701387   RcptNo: 1

Received by/date: AJ 01/10/17

Logged By:	Anne Thorne	1/10/2017 2:35:00 PM	Anne Thorne
Completed By:	Anne Thorne	1/11/2017 9:39:15 AM	Anne Thorne
Reviewed By:	[signature]	01/11/17	

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: 3
(<2 or >12 unless noted)
Adjusted? added 1mL HNO3 to SPLP leachate for acceptable pH AT 01/12/
Checked by: AT 01/12/17

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Not Present			

Chain-of-Custody Record

Client: Daniel B Stephens

Mailing Address: 6020 Academy NE
ABQ NM 87109

Phone #: 505-822-9400

email or Fax#: cjohannesen@dbstephens.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ________

☐ EDD (Type) ________

Turn-Around Time:
☒ Standard ☐ Rush ________

Project Name: PCB Sediment Sampling

Project #: WR14.0049.01.0000014

Project Manager: Chad Johannesen

Sampler: C. Johannesen

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
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4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1701387	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	PCB-8082A (SW-846)	Metals-6020A (aluminum, cadium, chromium, nickel, lead and zinc)	Air Bubbles (Y or N)
10/17	1215	soil	DomingoBaca_011017	2x 8oz	—	Leachate -004 -001												X	X	
1/10/17	1300	soil	Embudo_011017	"	—	-005 -002												X	X	
10/17	1400	soil	Fourhills_011017	"	—	-006 -003												X	X	

A011217

Date	Time	Relinquished by	Received by	Date	Time
17	1435	[signature]	[signature]	1/10/17	1435

Remarks: SPLP-Synthetic Precipitation leaching for metals

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Attachment 2

Wet and Dry Season Monitoring Results

Discharge Monitoring Reports (DMRs)

Waste Load Allocation Results

Bohannan Huston

Engineering
Spatial Data
Advanced Technologies

Courtyard I
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Albuquerque, NM
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toll free: 800.877.5332

MEMORANDUM

DATE: February 20, 2018

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

FROM: Craig Hoover, PE
Sarah Ganley, PE
Evan Burn, PE

SUBJECT: **CMC Wet Season, Wet Weather Stormwater Monitoring Data Verification, Analysis Results Database, and Reporting FY 2018 Wet Season (July 1, 2017, to October 31, 2017) Task 28 Reissued Memo**

Notification of In-Stream Water Quality Exceedances

For downstream notification purposes, the following parameters for in-stream samples taken in the Rio Grande for the FY 2018 wet season had results that exceeded applicable water quality standards for one or more samples: E. coli, Polychlorinated Biphenyls (PCBs), and Gross Alpha. Table 1 summarizes the samples with exceedances and the applicable water quality standard (WQS) that was exceeded. Additional details on the sampling results are provided in this memo.

Table 1: Parameters Detected Above Applicable Water Quality Standards
CMC FY 2018 Wet Season Monitoring

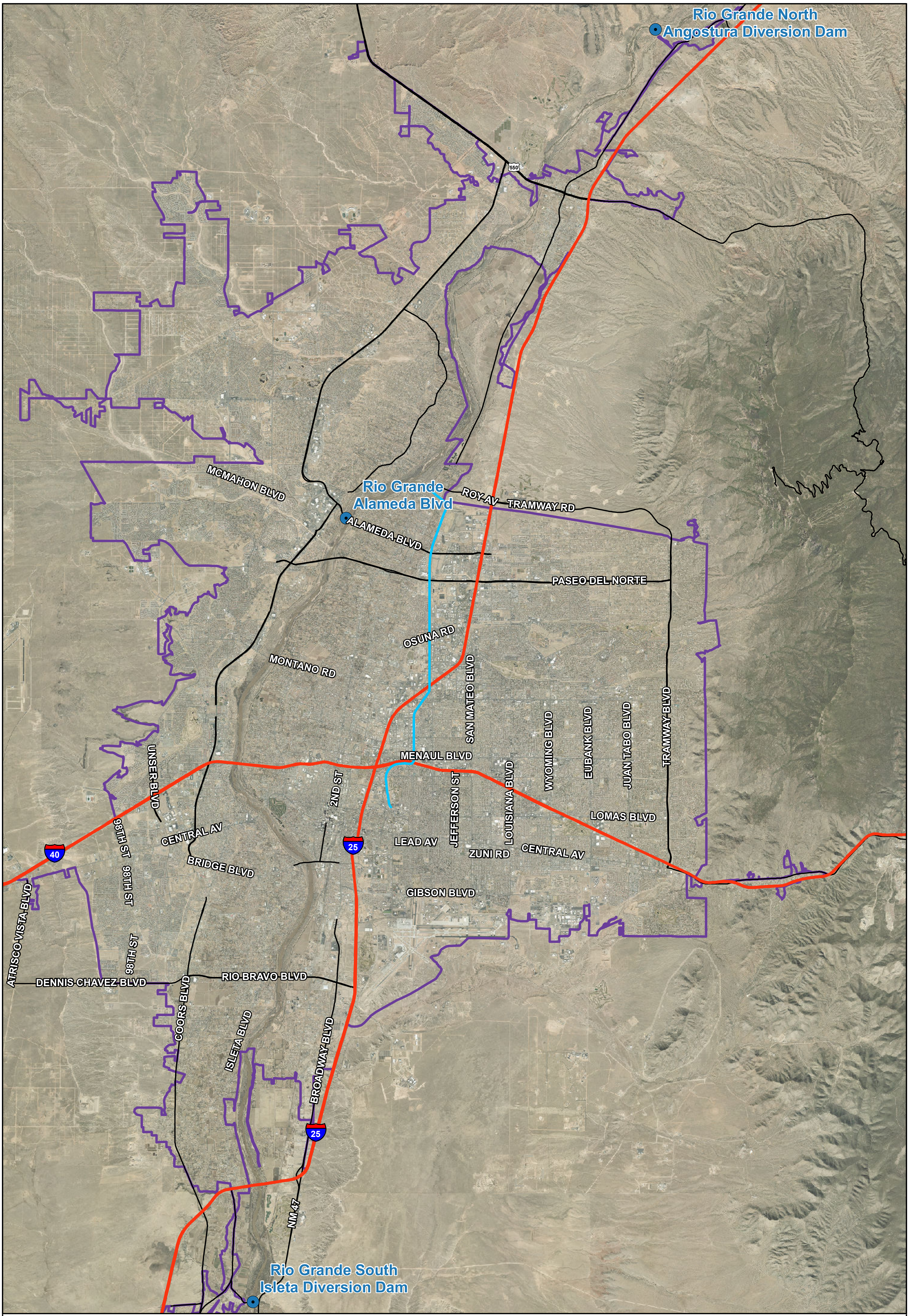
Sampling Date Location	Parameters, Applicable Water Quality Standard (WQS), and Results Exceeding Applicable WQS		
	E. coli	**PCBs**	**Gross Alpha**
	WQS: 88 CFU/100 ml Pueblo of Isleta Primary Contact Ceremonial & Recreational	**WQS: 0.00017 ug/L** Pueblo of Isleta Human Health Criteria (based on fish consumption only)	**WQS: 15 pCi/L** Pueblo of Isleta (General Standards) and NM domestic water supply and livestock watering
7/28/17 Rio Grande South Isleta Diversion Dam	236 CFU/100ml	0.000215 ug/L	No Exceedance
9/27/17 Rio Grande North Angostura Diversion Dam	733 CFU/100ml	0.00021 ug/L	No Exceedance
9/28/17 Rio Grande South Isleta Diversion Dam	6,131 CFU/100ml	0.00104 ug/L	20.9 pCi/L

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) 2018 (July 1, 2017, to June 30, 2018). 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 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 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 3). Four (4) samples were collected in FY 2017 toward the WSB MS4 Permit requirements. This task assumes the remaining three (3) storm events, weather permitting, will be sampled in FY 2018 (July 1, 2017, to June 30, 2018) at both the Rio Grande North and Rio Grande South locations identified in the CMC Monitoring Plan. In addition, a mid-point E. coli sample may be obtained in the Rio Grande at Alameda Blvd. for each of these events.

Of these three (3) remaining storm events, two (2) samples were collected during the FY 2018 wet season (July 1, 2017, to October 31, 2017). The CMC collected one FY 2018 wet season sample on July 27-28, 2017, and one on September 27-28, 2017.



AMAFCA

Bohannan ▲ Huston
www.bhinc.com 800.877.5332

Legend

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

N
W E
S

0 0.5 1 2
Miles

CMC Monitoring

Figure 1
Monitoring Locations

P:\20180302\WR\Reports\Preliminary & Draft\Figures\MXDs\Figure1-CMCMonitoringLocations.mxd
Author: eburn

The CMC Excel based database (created under Task 20) will be updated with the FY 2018 wet weather monitoring data as results are received. The database contains sample location, sample date, analyses conducted, methods used, applicable surface water quality standards (WQS), WSB MS4 Permit required Minimum Qualification Levels (MQL) and results. Any unusable data will be identified.

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
Indeno(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 $CaCO_3$) was added to the parameter list to allow dissolved metal results to be compared to the applicable WQSs. 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 3.

Rio Grande North – In-stream 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 – In-stream 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.

During this FY 2018 wet season, an E. coli only sampling point was added within the Rio Grande at Alameda Blvd. This is the location of the NMED defined stream segment divide. This sample point was added after discussion with NMED in February 2017 regarding potential refinements to E. coli loading calculations.

Sample Collection:

As mentioned previously, sample collection for the CMC is being conducted by DBS&A (through a separate on-call contract) as well as by CMC members. 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 Alameda and Rio Grande South locations.

DBS&A provided BHI with their field notes and field sample data (temperature, DO, specific conductivity, and pH) for the FY 2018 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 summary of the CMC comprehensive monitoring program activities completed for the FY 2018 wet season from July 2017 through October 2017. Two (2) qualifying storm events were sampled and analyzed during the FY 2018 wet season.

- **July 27-28, 2017 – Qualifying Storm Event – Full Analysis of Samples.** A sample was collected at the Rio Grande North location beginning at 12:30 p.m. on July 27 and sent to the laboratory for an E. coli only test. The CMC determined that the storm event beginning July 27 was a qualifying storm event. A sample in the Rio Grande at Alameda Blvd. was obtained at 10:30 p.m. and tested for E. coli at the Bernalillo Waste Water Treatment Plant (WWTP). A Rio Grande South sample was collected beginning at 8:45 a.m. on July 28; the samples from the North (from July 27) and South locations were taken to the HEAL laboratory for full parameter testing.
- **September 27-28, 2017 – Qualifying Storm Event – Full Analysis of Samples.** A sample was collected at the Rio Grande North location beginning at 12:00 p.m. on September 27 and sent to the laboratory for an E. coli only test. The CMC determined the storm event beginning September 27 was a qualifying storm event. A sample in the Rio Grande at Alameda Blvd. was obtained at 10:00 p.m. and tested for E. coli at the Bernalillo WWTP. A Rio Grande South sample was collected beginning at 1:40 p.m. on September 28; the samples from the North (from September 27) and South locations were taken to the laboratory for full parameter testing.

Stormwater Quality Database for CMC

As stated previously, there were two (2) qualifying storm events during the FY 2018 wet season, wet weather monitoring which occurred July 27-28 and September 27-28. DBS&A's field notes containing DO, pH, conductivity, and temperature measurements, as well as sampling comments have been received, and field results have been added to the database. Additionally, the HEAL and Bernalillo WWTP lab 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.

Database Data Entry:

The CMC Excel database was updated with the FY 2018 wet season, wet weather monitoring data. The database contains sample locations, sample date, analyses conducted, methods used, applicable surface water quality standards (WQS), WSB MS4 Permit required Minimum Quantification Levels (MQL), and analysis results. The database was updated under this Task to include the Rio Grande at Alameda sample location. Applicable surface WQS found in New Mexico Administrative Code (NMAC) 20.6.4 as well as the Pueblo of Isleta WQSs 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 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 only samples from the Rio Grande Alameda location 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 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.

There were not any CMC FY 2018 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 2018 Wet Season Assessment and Evaluation of Monitoring Results

The EPA approved WSB MS4 CMC Monitoring Plan, May 5, 2016, has thirty-three (33) parameters to monitor at the Rio Grande North and Rio Grande South monitoring locations. Of these thirty-three (33) parameters, thirteen (13) parameters were not detected in either of the FY 2018 wet season samples at either the Rio Grande North or South locations. Refer to Table 2 for a list of the parameters that were not detected.

Table 2: Parameters Not Detected
CMC FY 2018 Wet Season Monitoring

Parameters Not Detected	
Tetrahydrofuran	Dieldren
Benzo(a)pyrene	Pentachlorophenol
Benzo(b)fluoranthene (3, 4 Benzofluoranthene)	Benzidine
Benzo(k)fluoranthene	Benzo(a)anthracene
Chrysene	Dibenzofuran
Indeno(1,2,3-cd)Pyrene	Dibenzo(a,h)anthracene
Chromium VI (Hexavalent)	

For the remaining twenty (20) parameters on the CMC monitoring parameter list, only three parameters (E. coli, PCBs, and gross alpha) had exceedances of the applicable surface WQS found in New Mexico Administrative Code (NMAC) 20.6.4 and the Pueblo of Isleta WQS during the FY 2018 wet season. These exceedances are summarized on Table 1, page 1 and discussed below in further detail.

E. coli:

The E. coli results collected during the FY 2018 wet season are summarized in Table 3.

Table 3: E. coli Results
CMC FY 2018 Wet Season Monitoring

Date – Rio Grande Location	E. coli Results (CFU/100 ml)
July 27, 2017 – North	20
July 27, 2017 – Alameda	52
July 28, 2017 – South	236
Sept. 27, 2017 – North	733
Sept. 27, 2017 – Alameda	Result not usable
Sept. 28, 2017 – South	6,131

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 one (1) of the samples, the September 27-28, 2017 sample, had results that exceeded the primary contact-single sample Pueblo of Isleta and Pueblo of Sandia WQS (88 CFU/100 mL) as well as the primary contact-single sample NMAC WQS (410 CFU/100 ml). At the Rio Grande South location (downstream of the MS4 UA), two (2) samples were collected and tested for E. coli, and both of these samples had results that exceeded the Pueblo of Isleta and Pueblo of Sandia WQS (88 CFU/100 mL) and one (1) of the samples, the September 27-28, 2017 sample, also exceeded the primary contact-single sample NMAC WQS (410 CFU/100 ml).

In addition, the CMC added an E. coli sample point in the Rio Grande at Alameda. This added analysis point was based on discussions with NMED in February 2017 on collecting actual data at the stream segment divide verses using an area percentage (as defined in the TMDL) for E. coli loading calculations. For both FY 2018 wet season storm events, a sample was collected during each storm event at the Alameda location, and this sample was tested by the Bernalillo WWTP. However, the September 27-28, 2017, storm event sample result was not usable for CMC E. coli loading calculations, as the lab reported the result as too numerous to count.

Monthly geometric mean values were not able to be calculated and compared to applicable WQSs because the CMC had only one (1) sample per location in each July and September. As a reminder, in January 2017 the CMC members clarified with NMED that 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 while the lab reports are typically in units of MPN/100mL. The graph presented in this section uses 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 at the Rio Grande North and Rio Grande South locations
.

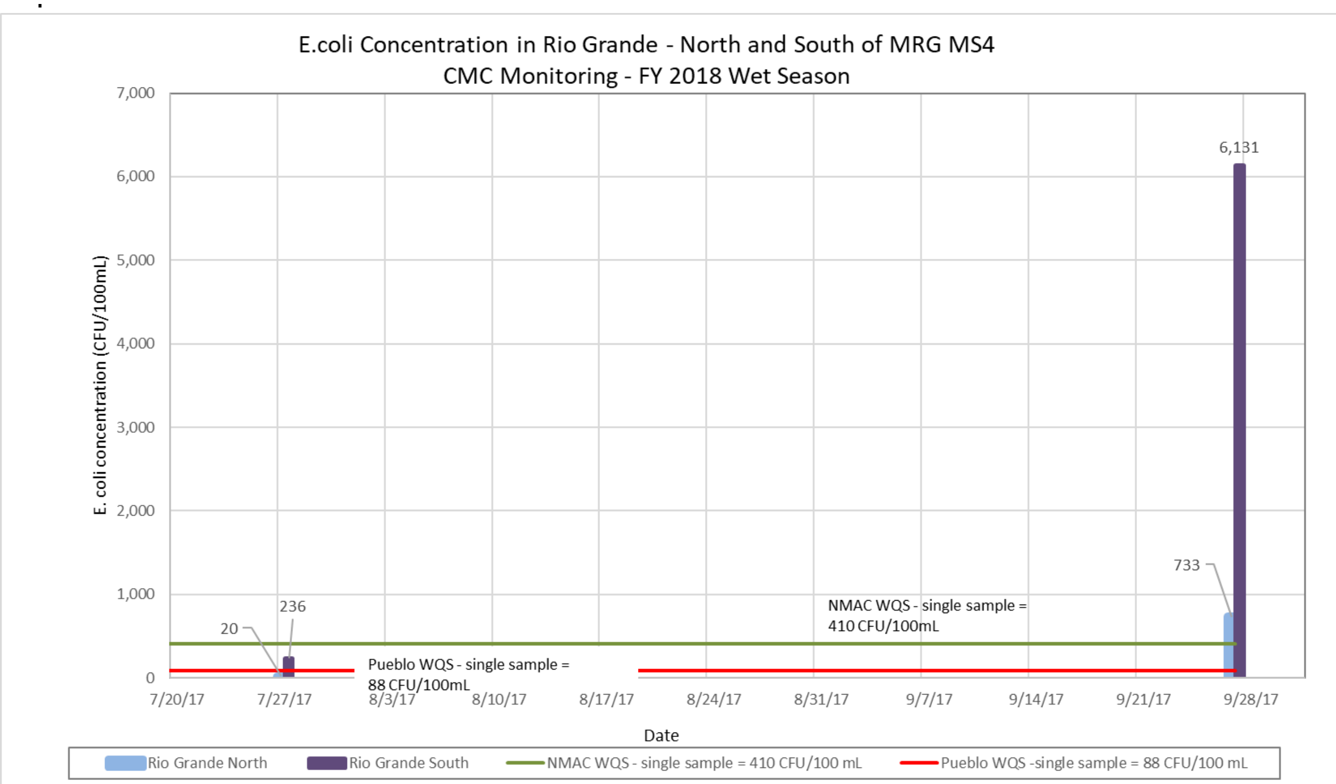


Figure 2: E. coli Results
CMC Monitoring – FY 2018 Wet Season

PCBs:

There are multiple surface water quality standard values listed for PCBs in both the Pueblo of Isleta and the State of New Mexico standards for the various designated uses. The PCBs measured in samples collected from the Rio Grande during the FY 2018 wet season stormwater events were all below the minimum quantification level (MQL) established in U.S. Environmental

Protection Agency (USEPA) standards for MS4 NPDES Permit (Appendix F, 0.2 ug/L for PCBs). The PCB results were also below the New Mexico Surface WQSs and Pueblo of Isleta Surface WQSs for designated uses including drinking water, wildlife habitat, acute aquatic life, and chronic aquatic life. However, three CMC samples from the Rio Grande were above the Pueblo of Isleta human health criteria (based on fish consumption only) WQS for surface waters, and one of these was also above the New Mexico human health-organism only (fish consumption only) WQS. The human health-organism only criterion is based upon human consumption of fish and other aquatic life that bioaccumulate contaminants over time. The FY 2018 wet season PCB results are shown in Figure 3 relative to various WQSs for PCBs.

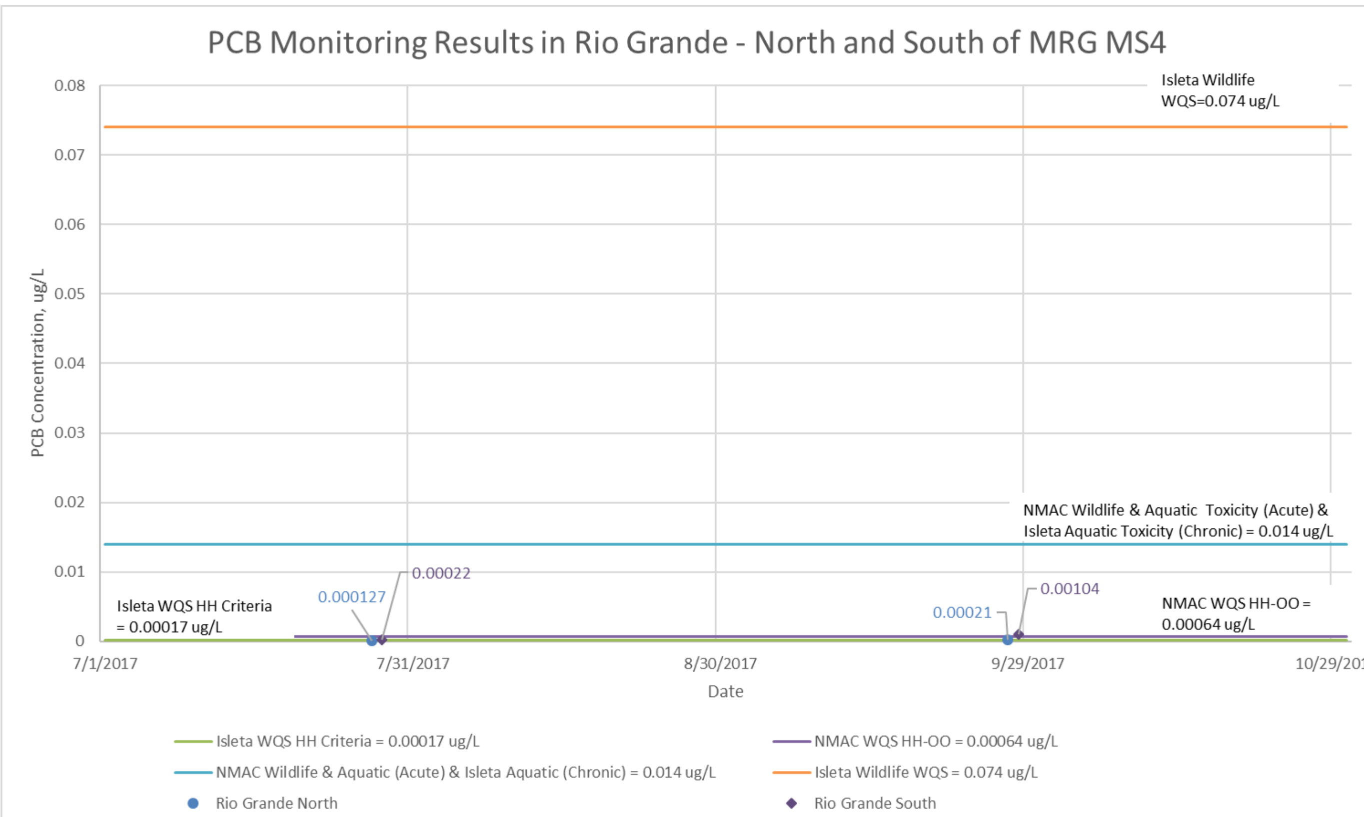


Figure 3: PCB Results
CMC Monitoring – FY 2018 Wet Season

Gross Alpha:

The September 27-28, 2017, Rio Grande South sample results exceeded the New Mexico and Pueblo of Isleta WQS for gross alpha. The WQS for Gross Alpha is the same value for both the NMAC 20.6.4 Water Quality Criterion and Pueblo of Isleta; the WQS of 15 pCi/L ("pCi/L" means picocuries per liter) is a general standard for the Pueblo of Isleta, and for New Mexico it is based on Domestic Water Supply and Livestock Watering designated uses. Once lab results were obtained and reviewed, the CMC was made aware of this exceedance on December 7, 2017. Sampling collection discussions with DBS&A did not note any variances from typical sampling procedures that would have impacted the analytical results for gross alpha (refer to Attachment 3 for additional documentation). In surface water, the gross alpha analyses may be affected by a high content of suspended load, particularly where sediment sources may be derived from granitic terrain; gross alpha results may reflect the radioactivity of the natural elements in the sediment more than the surface water.

The September 27-28, 2017, Rio Grande South Gross Alpha analytical results are detailed below; the units are in picocuries per liter (abbreviated as pCi/L):

- Rio Grande South CMC sample result = 20.9 pCi/L
- WQS at the Rio Grande South (Isleta Diversion Dam) location = 15 pCi/L (NMAC 20.6.4 Water Quality Criterion for livestock watering and domestic water supply designated uses and general standard for Pueblo of Isleta)

This is the first time the analytical results from a CMC sample has had an exceedance in gross alpha. The CMC will continue to closely evaluate this parameter in future samples. If additional exceedances occur, the CMC will discuss the results further and may consult NMED for further guidance.

Dissolved Oxygen and Temperature:

Two 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 and temperature. These two parameters did not have any surface water quality exceedances during the FY 2018 wet season sampling.

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 2018 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 2018 wet season. Refer to Figure 4 for dissolved oxygen results and comparison to applicable WQS.

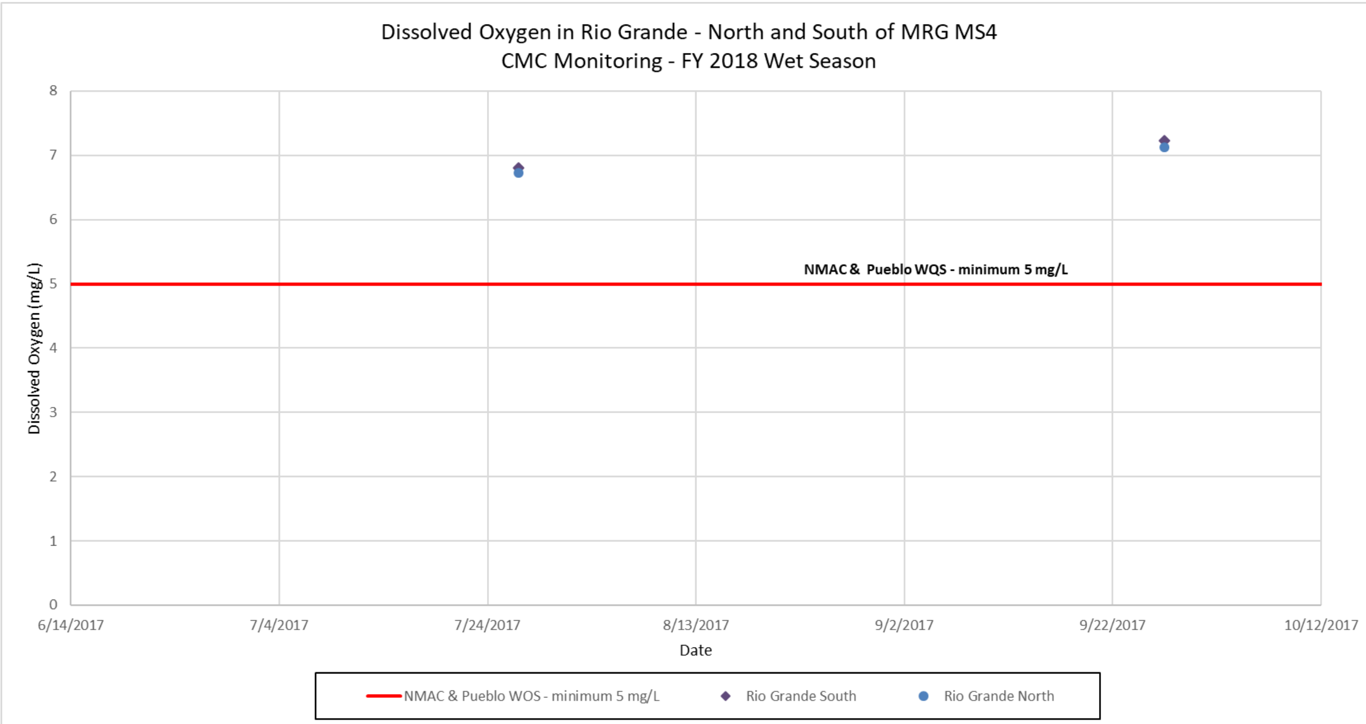


**Figure 4: Dissolved Oxygen Results for Rio Grande
CMC Monitoring – FY 2018 Wet Season**

Temperature is listed in the WSB MS4 Permit as a special condition (currently 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 WQS. The data collected during this FY 2018 wet season monitoring supports this conclusion. All the temperature field readings taken in the Rio Grande during the CMC FY 2018 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 5 for temperature results and comparison to applicable WQS.

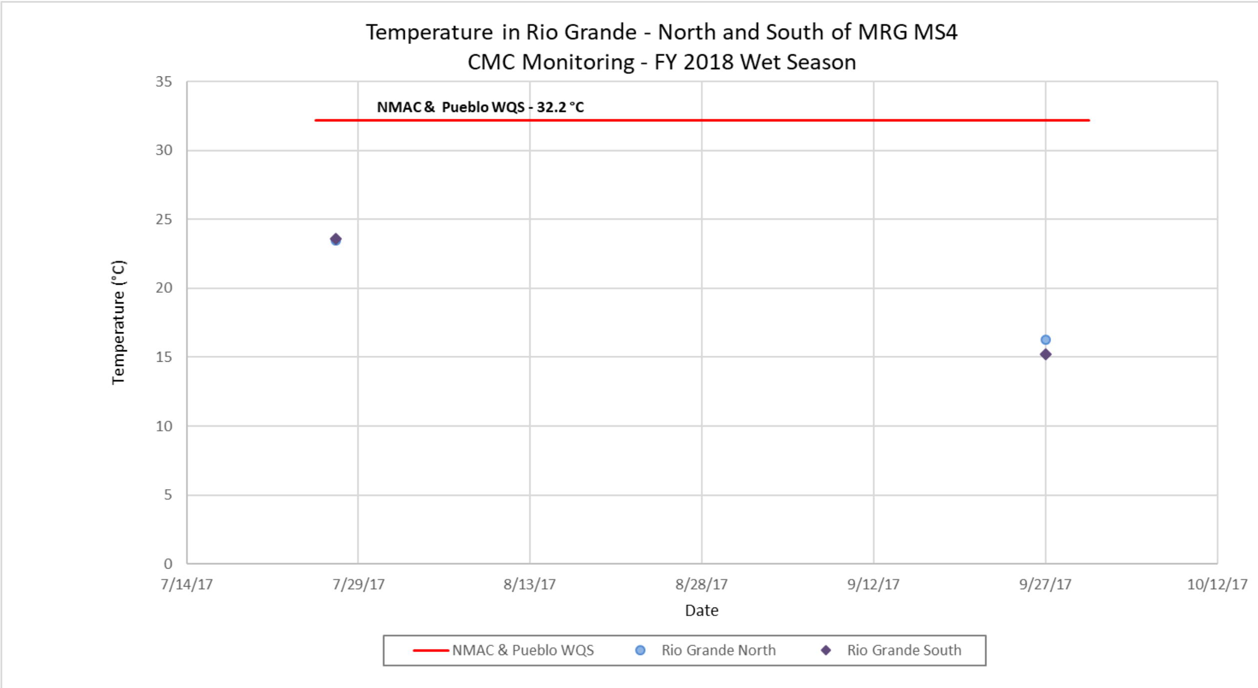


Figure 5: Temperature Monitoring Results in Rio Grande
CMC Monitoring – FY 2018 Wet Season

CMC FY 2018 Wet Season E. coli Loading Calculations and Waste Load Allocation (WLA)

Related to assessing the stormwater results, BHI has calculated the E. coli 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.

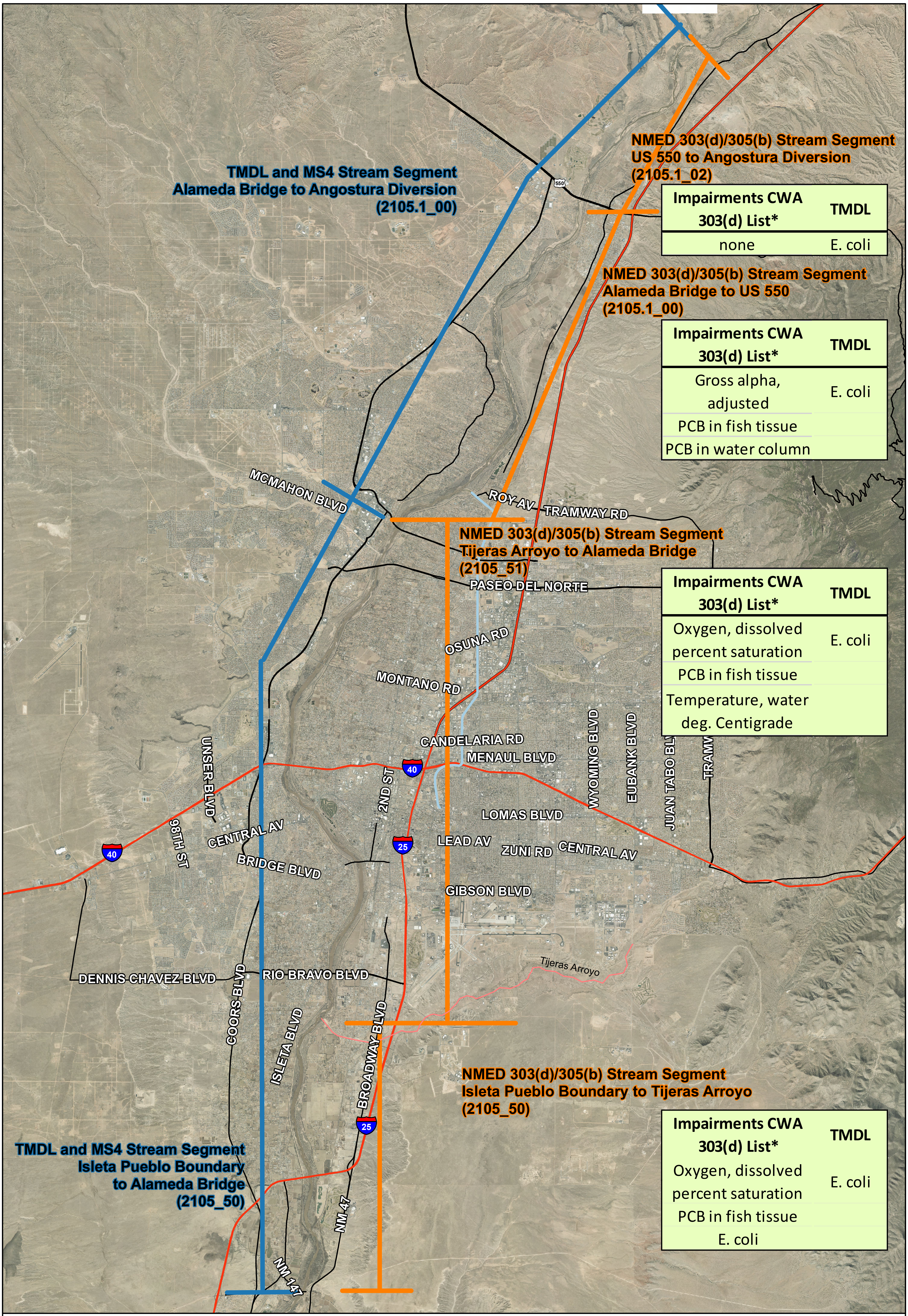
E. coli loading calculations and comparison to the WLA follows the WSB MS4 Permit requirements in "Discharges to Water Quality Impaired Water Bodies with an Approved TMDL," Part I.C.2.b.(i).(c).B, Appendix B-Total Maximum Daily Loads (TMDLs) Tables of the WSB MS4 Permit, and the NMED guidance provided to the CMC. Attached to this memo is the WLA Calculation spreadsheet which steps through the E. coli loading calculations and assumptions comparing the calculated E. coli loading to the CMC aggregate WLA defined by NMED.

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 6, page 15.

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 two (2) qualifying event wet season storm events—July 27-28 and September 27-28, 2017. For the July 27-28, 2017 event, the CMC obtained an E. coli sample in the Rio Grande at Alameda and used this to calculate the E. coli loading for the two river segments. Refer to Table 4 for a summary of the WLA comparison results. A spreadsheet is attached to this memo that provides the detailed calculations.



AMAFCA

Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- TMDL/MS4 Stream Segments
- NMED Stream Segments
- North Diversion Channel
- Interstate Highway
- U.S. Highway
- State Highway

* Final 2016-2018 State of NM Clean Water Act Section 303(d)/Section 305(b) Integrated Report

N W E S

0 0.5 1 2
Miles

CMC Monitoring

Figure 6
Rio Grande
NMED and MS4 Permit
Stream Segments

P:\20180302\WR\Reports\Preliminary & Draft\Figures\MXDs\Figure7-TMDLStreamSegments.mxd
Author: mbaltazar

Table 4: Summary of CMC 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
July 27-28, 2017 – Rio Grande North E. coli concentration = 20 CFU/100 mL, Rio Grande at Alameda E. coli concentration = 52 CFU/100 mL Rio Grande South E. coli Concentration = 236 CFU/100 mL					
Alameda to Angostura	545	Dry	2.50E+10	3.24E+10	WLA Acceptable
Isleta to Alameda	470	Dry	8.63E+10	1.57E+10	WLA Potential Exceedance
September 27-28, 2017 – Rio Grande North E. coli concentration = 733 CFU/100 mL and Rio Grande South E. coli Concentration = 6,131 CFU/100 mL					
Alameda to Angostura	983	Moist	7.34E+12	9.09E+10	WLA Potential Exceedance
Isleta to Alameda	1,190	Moist	2.18E+12	6.29E+10	WLA Potential Exceedance

As Table 4 illustrates, the E. coli loading for the July 27-28, 2017, storm event for the northern segment (Alameda to Angostura) was below the WLA for the CMC MS4s. This analysis used the mid-point E. coli sample result obtained in the Rio Grande at Alameda. The E. coli loading for the southern segment for the July 27-28, 2017, and both segments for the Sept. 27-28, 2017, event 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 CMC members are working toward understanding the WLA. In addition, the CMC members began implementing a refinement to the sampling plan discussed with NMED by obtaining an E. coli sample in the Rio Grande at Alameda during the FY 2018 wet season. This demonstrates that the CMC is continuing to investigate the potential exceedances and make 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. For this Task, BHI has not completed any data entry related to the EPA DMRs for the FY 2018 wet season. DMRs with this data are due to EPA on December 1, 2018, and these forms will be completed as directed by AMAFCA, as the delegated data entry member for the CMC.

Conclusions and Planning

During the FY 2018 wet season (July 1 to October 31, 2017), two (2) 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 CMC 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 2018 wet season show that:

- With the two FY 2018 wet season samples, six (6) of the seven (7) required samples in the WSB MS4 Permit Wet Weather Monitoring section have been obtained. 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 three (3) events during the wet season.
- 13 of the 33 parameters tested were not detected in any of the Rio Grande North or South samples.
- Several key parameters all met the applicable WQSs as they have for all the CMC samples to date:
    - All dissolved oxygen results were greater than 5 mg/L (minimum WQS).
    - All temperature results were less than 32.2 °C (maximum WQS).
- The PCB results were also below the New Mexico Surface WQSs and Pueblo of Isleta Surface WQSs for designated uses including drinking water, wildlife habitat, acute aquatic life, and chronic aquatic life. However, three CMC samples from the Rio Grande were above the Pueblo of Isleta human health criteria (based on fish consumption only) WQS for surface waters and one of these was also above the New Mexico human health-organism only (fish consumption only) WQS.
- The September 27-28, 2017, Rio Grande South sample results exceeded the WQS for gross alpha. This is the first time the analytical results from a CMC sample has had an exceedance in gross alpha. The CMC will continue to closely evaluate this parameter in future samples.
- The calculated E. coli loading for the July 27-28, 2017, storm event for the northern segment (Alameda to Angostura) was below the WLA for the CMC MS4s. This analysis used the mid-point E. coli sample result obtained in the Rio Grande at Alameda. The E. coli loading for the southern segment for the July 27-28, 2017, and both segments for the September 27-28, 2017, event all potentially exceeded the CMC allocated 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.

For planning purposed for the CMC members, the FY 2018 dry season monitoring activity (weather permitting), analytical results, and E. coli loading calculations will be summarized by BHI for the CMC in a memo due August 15, 2018.

SG/le

Attachments:

Attachment 1 – Hall Environmental Analysis Laboratory Reports with BHI Notes for FY 2018 Wet Season

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

Attachment 3 – Documentation from DBS&A Related to September 27-28, 2017, Sample Collection and Gross Alpha Analytical Result

Spreadsheets Included Separately:

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

Excel CMC Spreadsheet with FY 2018 Wet Season Stormwater Quality Monitoring Results

ATTACHMENT 1

HALL ENVIRONMENTAL ANALYSIS LABORATORY REPORTS WITH BHI NOTES FOR FY 2018 WET SEASON

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 11, 2017

July 27, 2017 Rio Grande North and Rio Grande at Alameda (pre storm) - E. coli results

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

RE: CMC

OrderNo.: 1707E07

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 2 sample(s) on 7/27/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E07-001 **Matrix:** AQUEOUS

Client Sample ID: Alameda-20170727
Collection Date: 7/27/2017 10:20:00 AM
Received Date: 7/27/2017 1:30:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM 9223B FECAL INDICATOR: E. COLI MPN						Analyst: **SMS**	
E. Coli	50.4	1.000		MPN/100mL	1	7/28/2017 4:04:00 PM	33053

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA **Client Sample ID:** Rio Grande-North-20170727
Project: CMC **Collection Date:** 7/27/2017 12:30:00 PM
Lab ID: 1707E07-002 **Matrix:** AQUEOUS **Received Date:** 7/27/2017 1:30:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM 9223B FECAL INDICATOR: E. COLI MPN							Analyst: **SMS**
E. Coli	20	10.00		MPN/100mL	10	7/28/2017 4:04:00 PM	33053

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: 1707E07   RcptNo: 1

Received By: Anne Thorne   7/27/2017 1:30:00 PM   Anne Thorne

Completed By: Anne Thorne   7/27/2017 1:43:54 PM   Anne Thorne

Reviewed By: 7/27 @ 1348

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Samples were collected the same day and chilled.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ________ (<2 or >12 unless noted)

Adjusted? ________

Checked by: ________

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	16.9	Good	Not Present			

Chain-of-Custody Record

Client: AMAFCA

Mailing Address: 2600 Prospect Ave
ABQ NM 87107

Phone #: 505-884-2215

email or Fax#: pchavez@AMAFCA.org

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ____

☐ EDD (Type) ____

Turn-Around Time:
☒ Standard ☐ Rush ____

Project Name: CMC

Project #: —

Project Manager: Patrick Chavez

Sampler: C Johannesen - DBSA

On Ice: ☒ Yes ☐ No

Sample Temperature: 16.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1707E07	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	E. coli - Num				Air Bubbles (Y or N)
7-27-17	1020	AQ	Alameda-20170727	1		201												X				
7-27-17	1230	AQ	RioGrande-North-20170727	1		202												X				

Date	Time	Relinquished by	Received by	Date	Time
7-27-17	1330	[signature]	[signature]	07/27/17	1330

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

July 27, 2018
Rio Grande at Alameda E. coli sample during storm event

Bernalillo WWTP

E. coli WORKSHEET

Time of Sampling: 10:30PM Time of Arrival: 10:47PM
Type of Sample: Grab Sample Instantaneous Flow: ________ MGD
Exact Location: ~~EFF WW~~ River Sample
Method Used: Hach m-ColiBlue 24 EPA Approved Method

Refrigerator Temperature: 4 °C
(Samples must be stored at <6°C)

In Incubator:
Date: 7-27-17 Time: 11:07PM Temp: 35.1 °C
24 Hours ± 2 hours. 35.0 ± 0.5°C

Out of Incubator:
Date: 7-28-17 Time: 9:31 Temp: 35.1 °C
24 Hours ± 2 hours. 35.0 ± 0.5°C

****Formula:** Calculate coliform density: Use all plates and filtered volumes that fall between the ideal range. Include duplicates and multiple dilutions.

Colonies/100 mL = (coliform colonies counted) X (100) / mLs Sample filtered

****Formula:** If no plate falls in the ideal range, use all plates and filtered volumes not categorized as TNTC or Confluent Growth.

Colonies/100 mL = (Sum of colonies in all samples) X (100) / Sum of volume (in mL) of all samples

(Use the worksheet below to calculate coliform density)

IF: The total number of colonies exceeds 200 per membrane, or the colonies are too indistinct for accurate counting, or exceed 60 blue colonies, report the results as "Too Numerous to Count (TNTC)" Or "confluent growth" as applies.

**Use plates that fall in the ideal range for Quantitative Determinations for e-coli (20-60)

E. coli Colonies Reported/100 mls
52

Sample	Volume	Blue Colonies
Blank I	100 mL	0
MW ~~25~~ 10	MW ~~25~~ mL 10 mL	6
MW ~~50A~~ 20A	MW ~~50~~ mL 20 mL	10
MW ~~50B~~ 20B	MW ~~50~~ mL 20 mL	14
MW ~~100~~ 50	MW ~~100~~ mL 50 mL	52
Blank II	100 mL	0

Sampled By: Mark Wootan

Analyzed By: Mark Wootan

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 21, 2017

July 27, 2018 Rio Grande North and
July 28, 2017 Rio Grand South results

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

RE: CMC

OrderNo.: 1707E46

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 6 sample(s) on 7/28/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Field Data - Provided by DBS&A (field notebook):
7/27/17 - Rio Grande North
DO = 6.73 mg/L, pH = 7.33, Conductivity = 247 umhos/cm, and Temperature = 23.47°C
7/28/17 - Rio Grande South
DO = 6.8 mg/L, pH = 8.13, Conductivity = 361 umhos/cm, and Temperature = 23.6°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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Website: www.hallenvironmental.com

Case Narrative

WO#: **1707E46**
Date: **9/21/2017**

CLIENT: AMAFCA
Project: CMC

Analytical Notes Regarding EPA Method 8260:
Both samples in this report were analzyed by EPA Method 8260, however Tetrahydrofuran was not included in the list of reportable compounds. We have scanned the samples using the MS for Tetrahydrofuran and this compound was not detected.

Analytical Notes Regarding EPA Method 8270:
Both samples in this report were analzyed by EPA Method 8270, however Benzidine and Dieldrin were not included in the list of reportable compounds. We have scanned the samples using the MS for Benzidine and Dieldrin and these compounds were not detected.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-001B

Client Sample ID: Rio Grande-North-20170727
Collection Date: 7/27/2017 12:30:00 PM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Benz(a)anthracene	ND	3.9	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Benzo(a)pyrene	ND	4.0	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Bis(2-ethylhexyl)phthalate	5.5	4.8	10	J	µg/L	1	8/11/2017 4:39:12 PM	33127
Chrysene	ND	3.8	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Dibenzofuran	ND	4.1	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	8/11/2017 4:39:12 PM	33127
Pentachlorophenol	ND	4.9	20		µg/L	1	8/11/2017 4:39:12 PM	33127
Surr: 2-Fluorophenol	52.2	0	15-88		%Rec	1	8/11/2017 4:39:12 PM	33127
Surr: Phenol-d5	40.6	0	15-72.4		%Rec	1	8/11/2017 4:39:12 PM	33127
Surr: 2,4,6-Tribromophenol	74.9	0	15-117		%Rec	1	8/11/2017 4:39:12 PM	33127
Surr: Nitrobenzene-d5	92.1	0	33.5-120		%Rec	1	8/11/2017 4:39:12 PM	33127
Surr: 2-Fluorobiphenyl	86.4	0	26.5-109		%Rec	1	8/11/2017 4:39:12 PM	33127
Surr: 4-Terphenyl-d14	64.2	0	21.7-98.7		%Rec	1	8/11/2017 4:39:12 PM	33127

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-001C

Client Sample ID: Rio Grande-North-20170727
Collection Date: 7/27/2017 12:30:00 PM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 1664B							Analyst: **MAB**	
N-Hexane Extractable Material	5.17	3.77	9.94	J	mg/L	1	8/1/2017	33094

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-North-20170727
Project:	CMC	**Collection Date:**	7/27/2017 12:30:00 PM
Lab ID:	1707E46-001E	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM5210B: BOD							Analyst: **SMS**	
Biochemical Oxygen Demand	DO Depletion<2.0	2.0	2.0		mg/L	1	8/2/2017 3:49:00 PM	33070

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-001F

Client Sample ID: Rio Grande-North-20170727
Collection Date: 7/27/2017 12:30:00 PM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Nitrogen, Nitrite (As N)	ND	0.0069	0.10		mg/L	1	7/28/2017 3:28:31 PM	R44608
Nitrogen, Nitrate (As N)	0.050	0.022	0.10	J	mg/L	1	7/28/2017 3:28:31 PM	R44608
SM 4500 NH3: AMMONIA							Analyst: **CJS**	
Nitrogen, Ammonia	ND	0.40	1.0		mg/L	1	8/2/2017 2:36:00 PM	R44684
SM4500-H+B: PH							Analyst: **JRR**	
pH	8.19			H	pH units	1	7/31/2017 1:10:24 PM	R44651
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **CJS**	
Phosphorus, Total (As P)	0.062	0.010	0.010		mg/L	1	8/8/2017 12:25:00 PM	33215
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: **SRM**	
Total Dissolved Solids	181	11.8	20.0		mg/L	1	8/3/2017 12:07:00 PM	33122
SM 4500 NORG C: TKN							Analyst: **smb**	
Nitrogen, Kjeldahl, Total	ND	0.44	1.0		mg/L	1	8/11/2017 11:11:00 AM	33282
SM 2540D: TSS							Analyst: **KS**	
Suspended Solids	32	3.9	4.0		mg/L	1	8/3/2017 2:30:00 PM	33138

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-North-20170727
Project:	CMC	**Collection Date:**	7/27/2017 12:30:00 PM
Lab ID:	1707E46-001G	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: METALS							Analyst: **TES**	
Calcium	34	0.078	1.0		mg/L	1	8/16/2017 3:33:23 PM	33360
Magnesium	6.0	0.25	1.0		mg/L	1	8/16/2017 3:33:23 PM	33360
SM2340B: HARDNESS							Analyst: **TES**	
Hardness (As CaCO3)	110	2.5	6.6		mg/L	1	8/16/2017	R45008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-North-20170727
Project:	CMC	**Collection Date:**	7/27/2017 12:30:00 PM
Lab ID:	1707E46-001H	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Copper	0.0011	0.00030	0.0010		mg/L	1	8/3/2017 7:13:20 PM	B44712
Lead	ND	0.00017	0.00050		mg/L	1	8/2/2017 9:11:04 PM	D44683

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-002A

Client Sample ID: ABQRD-East
Collection Date: 7/28/2017 7:15:00 AM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM 9223B FECAL INDICATOR: E. COLI MPN							Analyst: **SMS**	
E. Coli	1296	10.00	10.00		MPN/100	10	7/29/2017 3:29:00 PM	33077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-003B

Client Sample ID: Rio Grande-South-20170728
Collection Date: 7/28/2017 8:45:00 AM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Benzo(a)pyrene	ND	4.0	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Benzo(b)fluoranthene	ND	4.0	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Benzo(g,h,i)perylene	ND	4.0	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Benzo(k)fluoranthene	ND	4.4	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Bis(2-ethylhexyl)phthalate	ND	4.8	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Chrysene	ND	3.8	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Dibenz(a,h)anthracene	ND	4.6	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Dibenzofuran	ND	4.1	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Indeno(1,2,3-cd)pyrene	ND	4.2	10		µg/L	1	8/11/2017 6:03:09 PM	33127
Pentachlorophenol	ND	4.9	20		µg/L	1	8/11/2017 6:03:09 PM	33127
Surr: 2-Fluorophenol	43.3	0	15-88		%Rec	1	8/11/2017 6:03:09 PM	33127
Surr: Phenol-d5	32.4	0	15-72.4		%Rec	1	8/11/2017 6:03:09 PM	33127
Surr: 2,4,6-Tribromophenol	60.3	0	15-117		%Rec	1	8/11/2017 6:03:09 PM	33127
Surr: Nitrobenzene-d5	72.7	0	33.5-120		%Rec	1	8/11/2017 6:03:09 PM	33127
Surr: 2-Fluorobiphenyl	66.2	0	26.5-109		%Rec	1	8/11/2017 6:03:09 PM	33127
Surr: 4-Terphenyl-d14	55.0	0	21.7-98.7		%Rec	1	8/11/2017 6:03:09 PM	33127

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-003C

Client Sample ID: Rio Grande-South-20170728
Collection Date: 7/28/2017 8:45:00 AM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 1664B							Analyst: **MAB**	
N-Hexane Extractable Material	3.70	3.69	9.73	J	mg/L	1	8/1/2017	33094

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-South-20170728
Project:	CMC	**Collection Date:**	7/28/2017 8:45:00 AM
Lab ID:	1707E46-003D	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM 9223B FECAL INDICATOR: E. COLI MPN							Analyst: **SMS**	
E. Coli	235.9	1.000	1.000		MPN/100	1	7/29/2017 3:29:00 PM	33077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-South-20170728
Project:	CMC	**Collection Date:**	7/28/2017 8:45:00 AM
Lab ID:	1707E46-003E	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM5210B: BOD							Analyst: **SMS**	
Biochemical Oxygen Demand	2.0	2.0	2.0		mg/L	1	8/2/2017 3:49:00 PM	33070

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-South-20170728
Project:	CMC	**Collection Date:**	7/28/2017 8:45:00 AM
Lab ID:	1707E46-003F	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Nitrogen, Nitrite (As N)	ND	0.0069	0.10		mg/L	1	7/28/2017 3:53:21 PM	R44608
Nitrogen, Nitrate (As N)	0.88	0.022	0.10		mg/L	1	7/28/2017 3:53:21 PM	R44608
SM 4500 NH3: AMMONIA							Analyst: **CJS**	
Nitrogen, Ammonia	ND	0.40	1.0		mg/L	1	8/2/2017 2:36:00 PM	R44684
SM4500-H+B: PH							Analyst: **JRR**	
pH	8.20			H	pH units	1	7/31/2017 1:14:40 PM	R44651
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **CJS**	
Phosphorus, Total (As P)	0.33	0.010	0.010		mg/L	1	8/8/2017 1:10:00 PM	33215
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: **SRM**	
Total Dissolved Solids	248	11.8	20.0		mg/L	1	8/3/2017 12:07:00 PM	33122
SM 4500 NORG C: TKN							Analyst: **smb**	
Nitrogen, Kjeldahl, Total	0.84	0.44	1.0	J	mg/L	1	8/11/2017 11:11:00 AM	33282
SM 2540D: TSS							Analyst: **KS**	
Suspended Solids	63	3.9	4.0		mg/L	1	8/3/2017 2:30:00 PM	33138

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1707E46-003G

Client Sample ID: Rio Grande-South-20170728
Collection Date: 7/28/2017 8:45:00 AM
Matrix: Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 200.7: METALS							Analyst: **TES**	
Calcium	40	0.078	1.0		mg/L	1	8/16/2017 3:35:11 PM	33360
Magnesium	7.4	0.25	1.0		mg/L	1	8/16/2017 3:35:11 PM	33360
SM2340B: HARDNESS							Analyst: **TES**	
Hardness (As CaCO3)	130	2.5	6.6		mg/L	1	8/16/2017	R45008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Analytical Report
Lab Order: **1707E46**
Date Reported: **9/21/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-South-20170728
Project:	CMC	**Collection Date:**	7/28/2017 8:45:00 AM
Lab ID:	1707E46-003H	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Copper	0.0012	0.00030	0.0010		mg/L	1	8/3/2017 7:16:24 PM	B44712
Lead	ND	0.00017	0.00050		mg/L	1	8/2/2017 9:14:07 PM	D44683

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-North-20170727 FIL
Project:	CMC	**Collection Date:**	7/27/2017 12:30:00 PM
Lab ID:	1707E46-004A	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **JRR**	
Phosphorus, Total (As P)	0.025	0.010	0.010		mg/L	1	8/11/2017 12:57:10 PM	33306

Dissolved phosphorous - filtered sample

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT:	AMAFCA	**Client Sample ID:**	Rio Grande-South-20170728 FIL
Project:	CMC	**Collection Date:**	7/28/2017 8:45:00 AM
Lab ID:	1707E46-005A	**Matrix:**	Aqueous

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **JRR**	
Phosphorus, Total (As P)	0.25	0.010	0.010		mg/L	1	8/11/2017 12:58:40 PM	33306

Dissolved phosphorous - filtered sample

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

CFA | Cape Fear Analytical LLC
an affiliate of The GEL Group INC

3306 Kitty Hawk Road, Suite 120 Wilmington, NC 28405
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September 12, 2017

PCB lab report for July 27-28, 2017 was reissued to provide a reporting format consistent with other PCB reports provided for this CMC monitoring. Reissued lab report follows this completed lab report.

Mr. Andy Freeman
Hall Environmental
4901 Hawkins NE
Suite D
Albuquerque, New Mexico 87109

Re: Routine Analysis
Work Order: 11143
SDG: 1707E46

Dear Mr. Freeman:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 01, 2017. This original data report has been prepared and reviewed in accordance with CFA's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at 910-795-0421.

Sincerely,

Cynde Larkins

Cynde Larkins
Project Manager

Purchase Order: IDIQ Pricing
Enclosures

Wet Chemistry by Method 410.4

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
COD	19.9		10.0	1	08/01/2017 23:28	WG1004901

Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Wet Chemistry by Method 3500Cr C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		0.000500	1	08/04/2017 14:31	WG1006004

Wet Chemistry by Method 410.4

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
COD	15.0		10.0	1	08/01/2017 23:28	WG1004901

SAMPLE RESULTS - 04

Wet Chemistry by Method 3500Cr C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		0.000500	1	08/04/2017 14:47	WG1006004

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3238729-1 08/04/17 13:17

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Hexavalent Chromium	U		0.00015	0.000500

L925975-02 Original Sample (OS) • Duplicate (DUP)

(OS) L925975-02 08/04/17 14:31 • (DUP) R3238729-4 08/04/17 14:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Hexavalent Chromium	ND	0.000	1	0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3238729-2 08/04/17 13:31 • (LCSD) R3238729-3 08/04/17 13:42

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Hexavalent Chromium	0.00200	0.00200	0.00199	100	99	90-110			1	20

L926000-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L926000-03 08/04/17 15:28 • (MS) R3238729-5 08/04/17 15:36 • (MSD) R3238729-6 08/04/17 15:45

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Hexavalent Chromium	0.0500	0.0120	0.0628	0.0630	101	102	1	90-110			0	20

Method Blank (MB)

(MB) R3237807-1 08/01/17 23:26

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
COD	U		3	10.0

L926102-01 Original Sample (OS) • Duplicate (DUP)

(OS) L926102-01 08/01/17 23:31 • (DUP) R3237807-7 08/01/17 23:31

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
COD	10.5	11.0	1	5		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3237807-2 08/01/17 23:26 • (LCSD) R3237807-3 08/01/17 23:26

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
COD	242	241	239	100	99	90-110			1	20

L925999-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L925999-01 08/01/17 23:28 • (MS) R3237807-5 08/01/17 23:29 • (MSD) R3237807-6 08/01/17 23:29

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
COD	400	92.8	471	477	95	96	1	80-120			1	20

GLOSSARY OF TERMS

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1707E46
Pace Project No.: 30225841

Sample: 1707E46-001L Rio Grande-North- **Lab ID: 30225841001** Collected: 07/27/17 12:30 Received: 08/01/17 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**2.06 ± 1.60 (2.88) C:NA T:NA**	pCi/L	08/16/17 08:36	12587-46-1	

Sample: 1707E46-003L Rio Grande-South- **Lab ID: 30225841002** Collected: 07/28/17 08:45 Received: 08/01/17 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**2.15 ± 1.31 (1.90) C:NA T:NA**	pCi/L	08/16/17 08:36	12587-46-1	

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 1707E46
Pace Project No.: 30225841

QC Batch: 267183 | Analysis Method: EPA 900.0
QC Batch Method: EPA 900.0 | Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30225841001, 30225841002

METHOD BLANK: 1315323 | Matrix: Water
Associated Lab Samples: 30225841001, 30225841002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.319 ± 0.853 (2.04) C:NA T:NA	pCi/L	08/16/17 08:35	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1707E46
Pace Project No.: 30225841

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA
Project: CMC

Sample ID **MB-33094**	SampType: **MBLK**	TestCode: **EPA Method 1664B**		
Client ID: **PBW**	Batch ID: **33094**	RunNo: **44643**		
Prep Date: **8/1/2017**	Analysis Date: **8/1/2017**	SeqNo: **1414653**	Units: **mg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	ND	10.0								

Sample ID **LCS-33094**	SampType: **LCS**	TestCode: **EPA Method 1664B**		
Client ID: **LCSW**	Batch ID: **33094**	RunNo: **44643**		
Prep Date: **8/1/2017**	Analysis Date: **8/1/2017**	SeqNo: **1414654**	Units: **mg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	35.8	10.0	40.00	0	89.5	78	114			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB-33360** SampType: **MBLK** TestCode: **EPA Method 200.7: Metals**

Client ID: **PBW** Batch ID: **33360** RunNo: **45008**

Prep Date: **8/14/2017** Analysis Date: **8/16/2017** SeqNo: **1424221** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								

Sample ID **LLLCS-33360** SampType: **LCSLL** TestCode: **EPA Method 200.7: Metals**

Client ID: **BatchQC** Batch ID: **33360** RunNo: **45008**

Prep Date: **8/14/2017** Analysis Date: **8/16/2017** SeqNo: **1424222** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.50	1.0	0.5000	0	101	50	150			J
Magnesium	0.51	1.0	0.5000	0	103	50	150			J

Sample ID **LCS-33360** SampType: **LCS** TestCode: **EPA Method 200.7: Metals**

Client ID: **LCSW** Batch ID: **33360** RunNo: **45008**

Prep Date: **8/14/2017** Analysis Date: **8/16/2017** SeqNo: **1424223** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	51	1.0	50.00	0	102	85	115			
Magnesium	49	1.0	50.00	0	98.5	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW** Batch ID: **D44683** RunNo: **44683**
Prep Date: Analysis Date: **8/2/2017** SeqNo: **1413497** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.012	0.00050	0.01250	0	92.4	85	115			

Sample ID **LLLCS** SampType: **LCSLL** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **D44683** RunNo: **44683**
Prep Date: Analysis Date: **8/2/2017** SeqNo: **1413500** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.00048	0.00050	0.0005000	0	95.4	50	150			J

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW** Batch ID: **D44683** RunNo: **44683**
Prep Date: Analysis Date: **8/2/2017** SeqNo: **1413503** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.00050								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW** Batch ID: **B44712** RunNo: **44712**
Prep Date: Analysis Date: **8/3/2017** SeqNo: **1414078** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	0.024	0.0010	0.02500	0	94.3	85	115			

Sample ID **LLLCS** SampType: **LCSLL** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **B44712** RunNo: **44712**
Prep Date: Analysis Date: **8/3/2017** SeqNo: **1414079** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	0.0014	0.0010	0.001000	0	144	50	150			

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW** Batch ID: **B44712** RunNo: **44712**
Prep Date: Analysis Date: **8/3/2017** SeqNo: **1414080** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	ND	0.0010								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB**		SampType: **MBLK**			TestCode: **EPA Method 300.0: Anions**					
Client ID: **PBW**		Batch ID: **R44608**			RunNo: **44608**					
Prep Date:		Analysis Date: **7/28/2017**			SeqNo: **1410086**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								

Sample ID **LCS**		SampType: **LCS**			TestCode: **EPA Method 300.0: Anions**					
Client ID: **LCSW**		Batch ID: **R44608**			RunNo: **44608**					
Prep Date:		Analysis Date: **7/28/2017**			SeqNo: **1410087**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	93.2	90	110			
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	96.7	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **1707e46-001bms** SampType: **MS** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **Rio Grande-North-2** Batch ID: **33127** RunNo: **44929**

Prep Date: **8/2/2017** Analysis Date: **8/11/2017** SeqNo: **1421011** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	66	10	100.0	0	65.5	18.1	108			
4-Chloro-3-methylphenol	120	10	200.0	0	59.4	15	111			
2-Chlorophenol	130	10	200.0	0	65.0	15	113			
1,4-Dichlorobenzene	66	10	100.0	0	66.2	21	81.3			
2,4-Dinitrotoluene	57	10	100.0	0	57.4	27.4	101			
N-Nitrosodi-n-propylamine	74	10	100.0	0	73.7	24.9	107			
4-Nitrophenol	77	10	200.0	0	38.6	15	62.2			
Pentachlorophenol	100	20	200.0	0	51.5	15	96.9			
Phenol	71	10	200.0	0	35.6	15	64.7			
Pyrene	74	10	100.0	0	73.9	29.2	111			
1,2,4-Trichlorobenzene	76	10	100.0	0	75.8	22.9	94.8			
Surr: 2-Fluorophenol	94		200.0		46.8	15	88			
Surr: Phenol-d5	73		200.0		36.7	15	72.4			
Surr: 2,4,6-Tribromophenol	130		200.0		63.1	15	117			
Surr: Nitrobenzene-d5	82		100.0		81.5	33.5	120			
Surr: 2-Fluorobiphenyl	78		100.0		78.2	26.5	109			
Surr: 4-Terphenyl-d14	62		100.0		62.2	21.7	98.7			

Sample ID **1707e46-001bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **Rio Grande-North-2** Batch ID: **33127** RunNo: **44929**

Prep Date: **8/2/2017** Analysis Date: **8/11/2017** SeqNo: **1421012** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	60	10	100.0	0	60.0	18.1	108	8.80	30.5	
4-Chloro-3-methylphenol	130	10	200.0	0	62.9	15	111	5.66	50	
2-Chlorophenol	97	10	200.0	0	48.6	15	113	28.9	36.3	
1,4-Dichlorobenzene	46	10	100.0	0	46.3	21	81.3	35.4	42.1	
2,4-Dinitrotoluene	53	10	100.0	0	52.6	27.4	101	8.58	28.5	
N-Nitrosodi-n-propylamine	61	10	100.0	0	60.6	24.9	107	19.5	25.4	
4-Nitrophenol	42	10	200.0	0	21.1	15	62.2	58.4	50	R
Pentachlorophenol	93	20	200.0	0	46.5	15	96.9	10.2	50	
Phenol	57	10	200.0	0	28.5	15	64.7	22.3	46.1	
Pyrene	71	10	100.0	0	71.0	29.2	111	4.06	34.3	
1,2,4-Trichlorobenzene	61	10	100.0	0	60.6	22.9	94.8	22.3	43.6	
Surr: 2-Fluorophenol	67		200.0		33.6	15	88	0	0	
Surr: Phenol-d5	55		200.0		27.7	15	72.4	0	0	
Surr: 2,4,6-Tribromophenol	120		200.0		59.9	15	117	0	0	
Surr: Nitrobenzene-d5	64		100.0		64.0	33.5	120	0	0	
Surr: 2-Fluorobiphenyl	63		100.0		62.8	26.5	109	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1707E46**

Hall Environmental Analysis Laboratory, Inc.

21-Sep-17

Client: AMAFCA
Project: CMC

Sample ID **1707e46-001bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **Rio Grande-North-2** Batch ID: **33127** RunNo: **44929**
Prep Date: **8/2/2017** Analysis Date: **8/11/2017** SeqNo: **1421012** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	56		100.0		55.6	21.7	98.7	0	0	

Sample ID **lcs-33127** SampType: **LCS** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW** Batch ID: **33127** RunNo: **44929**
Prep Date: **8/2/2017** Analysis Date: **8/11/2017** SeqNo: **1421015** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	71	10	100.0	0	70.8	41.2	98.9			
4-Chloro-3-methylphenol	160	10	200.0	0	78.6	29.1	111			
2-Chlorophenol	140	10	200.0	0	69.8	23.3	108			
1,4-Dichlorobenzene	66	10	100.0	0	65.6	29.4	84.5			
2,4-Dinitrotoluene	61	10	100.0	0	61.0	36.6	88.7			
N-Nitrosodi-n-propylamine	83	10	100.0	0	82.7	46.9	106			
4-Nitrophenol	100	10	200.0	0	52.2	15	74.7			
Pentachlorophenol	130	20	200.0	0	63.2	28.1	85.4			
Phenol	100	10	200.0	0	52.2	15	78.2			
Pyrene	89	10	100.0	0	89.0	44.4	96.8			
1,2,4-Trichlorobenzene	81	10	100.0	0	80.8	34.3	89			
Surr: 2-Fluorophenol	120		200.0		58.1	15	88			
Surr: Phenol-d5	110		200.0		54.1	15	72.4			
Surr: 2,4,6-Tribromophenol	150		200.0		74.5	15	117			
Surr: Nitrobenzene-d5	87		100.0		86.6	33.5	120			
Surr: 2-Fluorobiphenyl	76		100.0		76.5	26.5	109			
Surr: 4-Terphenyl-d14	66		100.0		66.5	21.7	98.7			

Sample ID **mb-33127** SampType: **MBLK** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW** Batch ID: **33127** RunNo: **44929**
Prep Date: **8/2/2017** Analysis Date: **8/11/2017** SeqNo: **1421016** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID	**mb-33127**	SampType:	**MBLK**	TestCode:	**EPA Method 8270C: Semivolatiles**
Client ID:	**PBW**	Batch ID:	**33127**	RunNo:	**44929**
Prep Date:	**8/2/2017**	Analysis Date:	**8/11/2017**	SeqNo:	**1421016** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzoic acid	7.4	20								J
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1707E46**

Hall Environmental Analysis Laboratory, Inc.

21-Sep-17

Client: AMAFCA
Project: CMC

Sample ID **mb-33127**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **33127**	RunNo: **44929**
Prep Date: **8/2/2017**	Analysis Date: **8/11/2017**	SeqNo: **1421016** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	100		200.0		51.0	15	88			
Surr: Phenol-d5	90		200.0		44.9	15	72.4			
Surr: 2,4,6-Tribromophenol	130		200.0		66.9	15	117			
Surr: Nitrobenzene-d5	71		100.0		71.1	33.5	120			
Surr: 2-Fluorobiphenyl	65		100.0		65.3	26.5	109			
Surr: 4-Terphenyl-d14	59		100.0		59.2	21.7	98.7			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB-33070** SampType: **MBLK** TestCode: **SM5210B: BOD**

Client ID: **PBW** Batch ID: **33070** RunNo: **44761**

Prep Date: **7/28/2017** Analysis Date: **8/2/2017** SeqNo: **1415455** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	ND	2.0								

Sample ID **MB--33070** SampType: **MBLK** TestCode: **SM5210B: BOD**

Client ID: **PBW** Batch ID: **33070** RunNo: **44761**

Prep Date: **7/28/2017** Analysis Date: **8/2/2017** SeqNo: **1415456** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	ND	2.0								

Sample ID **LCS-33070** SampType: **LCS** TestCode: **SM5210B: BOD**

Client ID: **LCSW** Batch ID: **33070** RunNo: **44761**

Prep Date: **7/28/2017** Analysis Date: **8/2/2017** SeqNo: **1415457** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	150	2.0	198.0	0	74.0	58.5	126			

Sample ID **LCSD-33070** SampType: **LCSD** TestCode: **SM5210B: BOD**

Client ID: **LCSS02** Batch ID: **33070** RunNo: **44761**

Prep Date: **7/28/2017** Analysis Date: **8/2/2017** SeqNo: **1415458** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	150	2.0	198.0	0	74.7	58.5	126	1.02	34.6	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID	**MB-33077**	SampType:	**MBLK**	TestCode:	**SM 9223B Fecal Indicator: E. coli MPN**
Client ID:	**PBW**	Batch ID:	**33077**	RunNo:	**44737**
Prep Date:	**7/28/2017**	Analysis Date:	**7/29/2017**	SeqNo:	**1414707** Units: **MPN/100mL**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
E. Coli	<1	1.000								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB** SampType: **MBLK** TestCode: **SM 4500 NH3: Ammonia**

Client ID: **PBW** Batch ID: **R44684** RunNo: **44684**

Prep Date: Analysis Date: **8/2/2017** SeqNo: **1412888** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	1.0								

Sample ID **LCS** SampType: **LCS** TestCode: **SM 4500 NH3: Ammonia**

Client ID: **LCSW** Batch ID: **R44684** RunNo: **44684**

Prep Date: Analysis Date: **8/2/2017** SeqNo: **1412889** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	9.9	1.0	10.00	0	99.4	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB-33215** SampType: **MBLK** TestCode: **EPA Method 365.1: Total Phosphorous**
Client ID: **PBW** Batch ID: **33215** RunNo: **44794**
Prep Date: **8/7/2017** Analysis Date: **8/8/2017** SeqNo: **1416272** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	ND	0.010								

Sample ID **LCS-33215** SampType: **LCS** TestCode: **EPA Method 365.1: Total Phosphorous**
Client ID: **LCSW** Batch ID: **33215** RunNo: **44794**
Prep Date: **8/7/2017** Analysis Date: **8/8/2017** SeqNo: **1416273** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	0.24	0.010	0.2500	0	94.2	90	110			

Sample ID **MB-33306** SampType: **MBLK** TestCode: **EPA Method 365.1: Total Phosphorous**
Client ID: **PBW** Batch ID: **33306** RunNo: **44899**
Prep Date: **8/10/2017** Analysis Date: **8/11/2017** SeqNo: **1419952** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	ND	0.010								

Sample ID **LCS-33306** SampType: **LCS** TestCode: **EPA Method 365.1: Total Phosphorous**
Client ID: **LCSW** Batch ID: **33306** RunNo: **44899**
Prep Date: **8/10/2017** Analysis Date: **8/11/2017** SeqNo: **1419953** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	0.24	0.010	0.2500	0	94.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB-33122** SampType: **MBLK** TestCode: **SM2540C MOD: Total Dissolved Solids**

Client ID: **PBW** Batch ID: **33122** RunNo: **44703**

Prep Date: **8/1/2017** Analysis Date: **8/3/2017** SeqNo: **1413722** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-33122** SampType: **LCS** TestCode: **SM2540C MOD: Total Dissolved Solids**

Client ID: **LCSW** Batch ID: **33122** RunNo: **44703**

Prep Date: **8/1/2017** Analysis Date: **8/3/2017** SeqNo: **1413723** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1707E46**

21-Sep-17

Client: AMAFCA

Project: CMC

Sample ID **MB-33282** SampType: **MBLK** TestCode: **SM 4500 Norg C: TKN**

Client ID: **PBW** Batch ID: **33282** RunNo: **44897**

Prep Date: **8/9/2017** Analysis Date: **8/11/2017** SeqNo: **1419895** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID **LCS-33282** SampType: **LCS** TestCode: **SM 4500 Norg C: TKN**

Client ID: **LCSW** Batch ID: **33282** RunNo: **44897**

Prep Date: **8/9/2017** Analysis Date: **8/11/2017** SeqNo: **1419896** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.9	1.0	10.00	0	99.4	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1707E46**

Hall Environmental Analysis Laboratory, Inc.

21-Sep-17

Client: AMAFCA
Project: CMC

Sample ID **MB-33138**	SampType: **MBLK**	TestCode: **SM 2540D: TSS**	
Client ID: **PBW**	Batch ID: **33138**	RunNo: **44710**	
Prep Date: **8/2/2017**	Analysis Date: **8/3/2017**	SeqNo: **1413945**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0								

Sample ID **LCS-33138**	SampType: **LCS**	TestCode: **SM 2540D: TSS**	
Client ID: **LCSW**	Batch ID: **33138**	RunNo: **44710**	
Prep Date: **8/2/2017**	Analysis Date: **8/3/2017**	SeqNo: **1413946**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	87	4.0	91.10	0	95.5	84.63	120.75			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: 1707E46   RcptNo: 1

Received By: **Sophia Campuzano** 7/28/2017 10:47:00 AM Sophia Campuzano

Completed By: **Ashley Gallegos** 7/28/2017 10:58:12 AM

Reviewed By: ENM 7/28/17 @ 1215

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Approved by client.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: 14
(<2 or >12 unless noted)
Adjusted? NO
Checked by: JMO

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:	Alan Lewis	Date	7/28/2017
By Whom:	Sophia Campuzano	Via:	☐ eMail ☐ Phone ☐ Fax ☑ In Person
Regarding:	High Temp		
Client Instructions:	Proceed with analysis		

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	9.6	Good	Not Present			

Chain-of-Custody Record

Client: AMAFCA

Mailing Address: 2600 Prospect Ave
ABQ, NM 87107

Phone #: 505 884 2215

email or Fax#: pchavez@amafca.org

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:
☑ Standard ☐ **Rush** ______

Project Name: CMC

Project #: —

Project Manager: PATRICK CHAVEZ

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 9.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1707E40	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	E. Coli - num	See attached	Diss Phos		Air Bubbles (Y or N)
7/27/17	1230	AQ	Rio Grande-North-20170727			-001													X			
7/28/17	0715	AQ	ABQRD-East			-002												X				
7/28/17	845	AQ	Rio Grande-South-20170728			-003													X			
07/27	1230		Rio Grande North 20170727 Filtered			-004														X		
07/28	845		Rio Grande South 20170728 Filtered			-005														X		
			07/28/17																			

Date:	Time:	Relinquished by:	Received by:	Date	Time
7/28	1047	ALAN LEWIS	Sophi C	07/28/17	1047
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
High temp approved by client. See temp above. SRE 07/28/17
* -001 E. coli Enumeration for -001 submitted 07/27/17 07/28/17

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Collaborative Monitoring Cooperative - Analyses List
Attach to Chain of Custody

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL (µg/L)
Hardness (Ca + Mg)	NA	Total	200.7	2.4
Lead	7439-92-1	Dissolved	200.8	0.09
Copper	7440-50-8	Dissolved	200.8	1.06
Ammonia + organic nitrogen	7664-41-7	Total	350.1	31.32
Total Kjehldal Nitrogen	17778-88-0	Total	351.2	58.78
Nitrate + Nitrite	14797-55-8	Total	353.2	10.17
Polychlorinated biphenyls (PCBs)	1336-36-3	Total	1668	0.014
Tetrahydrofuran (THF)	109-99-9	Total	8260C	7.9
bis(2-Ethylhexyl)phthalate	117-81-7	Total	8270D	0.2
Dibenzofuran	132-64-9	Total	8270D	0.2
Indeno(1,2,3-cd)pyrene	193-39-5	Total	8270D	0.2
Benzo(b)fluoranthene	205-99-2	Total	8270D	0.1
Benzo(k)fluoranthene	207-08-9	Total	8270D	0.1
Chrysene	218-01-9	Total	8270D	0.2
Benzo(a)pyrene	50-32-8	Total	8270D	0.3
Dibenzo(a,h)anthracene	53-70-3	Total	8270D	0.3
Benzo(a)anthracene	56-55-3	Total	8270D	0.2
Dieldrin	60-57-1	Total	8270D	0.1
Pentachlorophenol	87-86-5	Total	8270D	0.2
Benzidine	92-87-5	Total	8270D	0.1
Chemical Oxygen Demand	E1641638[2]	Total	HACH	5100
Gross alpha (adjusted)	NA	Total	Method 900	0.1 pCi/L
Total Dissolved Solids	E1642222[2]	Total	SM 2540C	60.4
Total Suspended Solids	NA	Total	SM 2540D	3450
Biological Oxygen Demand	N/A	Total	Standard Methods	930
Oil and Grease		Total	1664A	5000
Ecoli — num			SM 9223B	
pH			SM 4500	
Phosphorus		Dissolved	365.1	100
Phosphorus		Total	365.1	100
Chromium IV		Total	3500Cr C-2011	100

Appendix F - Minimum Quantification Levels (MQL's)

The following Minimum Quantification Levels (MQL's) are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
METALS, RADIOACTIVITY, CYANIDE and CHLORINE			
Aluminum	2.5	Molybdenum	10
Antimony	60	Nickel	0.5
Arsenic	0.5	Selenium	5
Barium	100	Silver	0.5
Beryllium	0.5	Thalllium	0.5
Boron	100	Uranium	0.1
Cadmium	1	Vanadium	50
Chromium	10	Zinc	20
Cobalt	50	Cyanide	10
Copper	0.5	Cyanide, weak acid dissociable	10
Lead	0.5	Total Residual Chlorine	33
Mercury (*)	0.0005 0.005		
DIOXIN			
2,3,7,8-TCDD	0.00001		
VOLATILE COMPOUNDS			
Acrolein	50	1,3-Dichloropropylene	10
Acrylonitrile	20	Ethylbenzene	10
Benzene	10	Methyl Bromide	50
Bromoform	10	Methylene Chloride	20
Carbon Tetrachloride	2	1,1,2,2-Tetrachloroethane	10
Chlorobenzene	10	Tetrachloroethylene	10
Clorodibromomethane	10	Toluene	10
Chloroform	50	1,2-trans-Dichloroethylene	10
Dichlorobromomethane	10	1,1,2-Trichloroethane	10
1,2-Dichloroethane	10	Trichloroethylene	10
1,1-Dichloroethylene	10	Vinyl Chloride	10
1,2-Dichloropropane	10		
ACID COMPOUNDS			
2-Chlorophenol	10	2,4-Dinitrophenol	50
2,4-Dichlorophenol	10	Pentachlorophenol	5
2,4-Dimethylphenol	10	Phenol	10
4,6-Dinitro-o-Cresol	50	2,4,6-Trichlorophenol	10

CFA Cape Fear Analytical LLC
an affiliate of The GEL Group INC

3306 Kitty Hawk Road, Suite 120 Wilmington, NC 28405
P 910.795.0421

www.capefearanalytical.com

November 02, 2017

Mr. Andy Freeman
Hall Environmental
4901 Hawkins NE
Suite D
Albuquerque, New Mexico 87109

Reissued Lab report for PCB testing of July 27-28, 2017 stormwater samples. Reissued to provide a consistent reporting format with previous CMC reporting.

Re: Routine Analysis
Work Order: 11143
SDG: 1707E46

Dear Mr. Freeman:

Cape Fear Analytical, LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 01, 2017. This revised data report has been prepared and reviewed in accordance with CFA's standard operating procedures. Refer to the fractional case narrative for revision details.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (910) 795-0421.

Sincerely,

Cynde Larkins

Cynde Larkins
Project Manager

Purchase Order: IDIQ Pricing
Enclosures

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107
Website: www.hallenvironmental.com

SUB CONTRATOR: Cape Fear Analytical COMPANY: Cape Fear Analytical PHONE: (910) 795-0421 FAX:

ADDRESS: 3306 Kitty Hawk Rd Ste 120 ACCOUNT #: EMAIL:

CITY, STATE, ZIP: Wilmington, NC 28405

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	1707E46-001K	Rio Grande-North-20170727		Aqueous	7/27/2017 12:30:00 PM	1	PCB CONGENERS PREP 1668
2	1707E46-003K	Rio Grande-South-20170728		Aqueous	7/28/2017 8:45:00 AM	1	PCB CONGENERS PREP 1668

CFA WO #11143

SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By: [signature]	7/28/2017	11:34 AM	Received By: Cynde Larkins	01AUG17	1000
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☐ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples 0.1 °C Attempt to Cool ? ______
Comments:

SAMPLE RECEIPT CHECKLIST
Cape Fear Analytical

Client: HALL	Work Order: 11143
Shipping Company: FedEx	Date/Time Received: 01 AUG 17 1000

Suspected Hazard Information	Yes	NA	No
Shipped as DOT Hazardous?			✓
Samples identified as Foreign Soil?			✓

DOE Site Sample Packages	Yes	NA	No*
Screened <0.5 mR/hr?		✓	
Samples < 2x background?		✓	

* Notify RSO of any responses in this column immediately.

Air Sample Receipt Specifics	Yes	NA	No
Air sample in shipment?			✓

Air Witness: ______

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other(describe)
2	Chain of Custody documents included with shipment?	✓			
3	Samples requiring cold preservation within 0-6°C?	✓			Preservation Method: ice bags blue ice dry ice none other (describe) 3.0° - 2.9 = 0.1°C
4	Aqueous samples found to have visible solids?	✓			Sample IDs, containers affected: Minimal visible solids
5	Samples requiring chemical preservation at proper pH?				Sample IDs, containers affected and pH observed: If preservative added, Lot#:
6	Samples requiring preservation have no residual chlorine?				Sample IDs, containers affected: If preservative added, Lot#:
7	Samples received within holding time?	✓			Sample IDs, tests affected:
8	Sample IDs on COC match IDs on containers?	✓			Sample IDs, containers affected:
9	Date & time of COC match date & time on containers?	✓			Sample IDs, containers affected:
10	Number of containers received match number indicated on COC?	~~✓~~ cf 01AUG17		✓	List type and number of containers / Sample IDs, containers affected: 2 - 1L WMA per sample
11	COC form is properly signed in relinquished/received sections?	✓			

Comments:

Checklist performed by: Initials: Cf Date: 01AUG17

CF-UD-F-7

PCB Congeners Analysis

Case Narrative

PCBC Case Narrative
Hall Environmental Analysis Laboratory (HALL)
SDG 1707E46
Work Order 11143

Revision 1

This data package has been revised to report results with J flags to the EDL, and report non-detects as ND.

Method/Analysis Information

Product:	**PCB Congeners by EPA Method 1668A in Liquids**
Analytical Method:	EPA Method 1668A
Extraction Method:	SW846 3520C
Analytical Batch Number:	35299
Clean Up Batch Number:	35298
Extraction Batch Number:	35297

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA Method 1668A:

Sample ID	Client ID
11143001	1707E46-001K Rio Grande-North-20170727
11143002	1707E46-003K Rio Grande-South-20170728
12019228	Method Blank (MB)
12019229	Laboratory Control Sample (LCS)
12019230	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-003 REV# 6.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Certification Statement
The test results presented in this document are certified to meet all requirements of the 2009 TNI Standard.

Method Blank (MB) Statement
The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
One surrogate recovered outside the acceptance limits. 12019230 (LCSD).

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery
The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement
The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation
A matrix spike and matrix spike duplicate analysis was not required for this SDG.

Technical Information

Holding Time Specifications
CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Nonconformance (NCR) Documentation
A NCR was not required for this SDG.

Manual Integrations
Manual integrations were required for data files in this SDG. Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

System Configuration
This analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
HRP791_1	PCB Analysis	PCB Analysis	SPB-Octyl	30m x 0.25mm, 0.25um

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Sample Data Summary

Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

Certificate of Analysis Report
for

HALL001 Hall Environmental Analysis Laboratory

Client SDG: 1707E46 CFA Work Order: 11143

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- C Congener has coeluters. When Cxxx, refer to congener number xxx for data
- J Value is estimated
- U Analyte was analyzed for, but not detected above the specified detection limit.

Review/Validation

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

The following data validator verified the information presented in this case narrative:

Signature: Heather Patterson **Name: Heather Patterson**

Date: 02 NOV 2017 **Title: Group Leader**

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB	U	ND	pg/L	8.16	21.8
2051-61-8	2-MoCB	U	ND	pg/L	7.75	21.8
2051-62-9	3-MoCB	U	ND	pg/L	6.55	21.8
13029-08-8	4-DiCB	U	ND	pg/L	27.7	21.8
16605-91-7	5-DiCB	U	ND	pg/L	16.7	21.8
25569-80-6	6-DiCB	U	ND	pg/L	13.6	21.8
33284-50-3	7-DiCB	U	ND	pg/L	15.0	21.8
34883-43-7	8-DiCB	U	ND	pg/L	12.5	21.8
34883-39-1	9-DiCB	U	ND	pg/L	16.1	21.8
33146-45-1	10-DiCB	U	ND	pg/L	15.7	21.8
2050-67-1	11-DiCB	J	47.1	pg/L	15.3	109
2974-92-7	12-DiCB	CU	ND	pg/L	14.6	43.6
2974-90-5	13-DiCB	C12				
34883-41-5	14-DiCB	U	ND	pg/L	14.6	21.8
2050-68-2	15-DiCB	U	ND	pg/L	14.2	21.8
38444-78-9	16-TrCB	U	ND	pg/L	6.48	21.8
37680-66-3	17-TrCB	U	ND	pg/L	6.70	21.8
37680-65-2	18-TrCB	CU	ND	pg/L	5.83	43.6
38444-73-4	19-TrCB	U	ND	pg/L	7.46	21.8
38444-84-7	20-TrCB	CJ	8.34	pg/L	4.87	43.6
55702-46-0	21-TrCB	CU	ND	pg/L	4.74	43.6
38444-85-8	22-TrCB	U	ND	pg/L	5.06	21.8
55720-44-0	23-TrCB	U	ND	pg/L	4.91	21.8
55702-45-9	24-TrCB	U	ND	pg/L	5.50	21.8
55712-37-3	25-TrCB	U	ND	pg/L	4.23	21.8
38444-81-4	26-TrCB	CU	ND	pg/L	4.71	43.6
38444-76-7	27-TrCB	U	ND	pg/L	5.00	21.8
7012-37-5	28-TrCB	C20				
15862-07-4	29-TrCB	C26				
35693-92-6	30-TrCB	C18				
16606-02-3	31-TrCB	U	ND	pg/L	8.25	21.8
38444-77-8	32-TrCB	U	ND	pg/L	4.58	21.8

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
38444-86-9	33-TrCB	C21				
37680-68-5	34-TrCB	U	ND	pg/L	5.15	21.8
37680-69-6	35-TrCB	U	ND	pg/L	6.13	21.8
38444-87-0	36-TrCB	U	ND	pg/L	5.94	21.8
38444-90-5	37-TrCB	U	ND	pg/L	6.20	21.8
53555-66-1	38-TrCB	U	ND	pg/L	6.09	21.8
38444-88-1	39-TrCB	U	ND	pg/L	5.83	21.8
38444-93-8	40-TeCB	CU	ND	pg/L	4.54	43.6
52663-59-9	41-TeCB	U	ND	pg/L	5.70	21.8
36559-22-5	42-TeCB	U	ND	pg/L	4.63	21.8
70362-46-8	43-TeCB	U	ND	pg/L	5.67	21.8
41464-39-5	44-TeCB	CJ	6.63	pg/L	4.58	65.5
70362-45-7	45-TeCB	CU	ND	pg/L	3.38	43.6
41464-47-5	46-TeCB	U	ND	pg/L	3.43	21.8
2437-79-8	47-TeCB	C44				
70362-47-9	48-TeCB	U	ND	pg/L	4.93	21.8
41464-40-8	49-TeCB	CU	ND	pg/L	4.26	43.6
62796-65-0	50-TeCB	CU	ND	pg/L	3.21	43.6
68194-04-7	51-TeCB	C45				
35693-99-3	52-TeCB	U	ND	pg/L	5.00	21.8
41464-41-9	53-TeCB	C50				
15968-05-5	54-TeCB	U	ND	pg/L	2.36	21.8
74338-24-2	55-TeCB	U	ND	pg/L	3.88	21.8
41464-43-1	56-TeCB	U	ND	pg/L	4.04	21.8
70424-67-8	57-TeCB	U	ND	pg/L	3.84	21.8
41464-49-7	58-TeCB	U	ND	pg/L	4.06	21.8
74472-33-6	59-TeCB	CU	ND	pg/L	3.73	65.5
33025-41-1	60-TeCB	U	ND	pg/L	3.86	21.8
33284-53-6	61-TeCB	CU	ND	pg/L	7.31	87.3
54230-22-7	62-TeCB	C59				
74472-34-7	63-TeCB	U	ND	pg/L	3.62	21.8
52663-58-8	64-TeCB	U	ND	pg/L	3.60	21.8

Comments:
C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
33284-54-7	65-TeCB	C44				
32598-10-0	66-TeCB	J	4.50	pg/L	3.64	21.8
73575-53-8	67-TeCB	U	ND	pg/L	3.45	21.8
73575-52-7	68-TeCB	U	ND	pg/L	3.64	21.8
60233-24-1	69-TeCB	C49				
32598-11-1	70-TeCB	C61				
41464-46-4	71-TeCB	C40				
41464-42-0	72-TeCB	U	ND	pg/L	3.64	21.8
74338-23-1	73-TeCB	U	ND	pg/L	3.93	21.8
32690-93-0	74-TeCB	C61				
32598-12-2	75-TeCB	C59				
70362-48-0	76-TeCB	C61				
32598-13-3	77-TeCB	U	ND	pg/L	3.51	21.8
70362-49-1	78-TeCB	U	ND	pg/L	3.34	21.8
41464-48-6	79-TeCB	U	ND	pg/L	3.16	21.8
33284-52-5	80-TeCB	U	ND	pg/L	3.36	21.8
70362-50-4	81-TeCB	U	ND	pg/L	3.40	21.8
52663-62-4	82-PeCB	U	ND	pg/L	3.47	21.8
60145-20-2	83-PeCB	U	ND	pg/L	4.10	21.8
52663-60-2	84-PeCB	U	ND	pg/L	3.95	21.8
65510-45-4	85-PeCB	CU	ND	pg/L	2.73	65.5
55312-69-1	86-PeCB	CJ	4.50	pg/L	2.90	131
38380-02-8	87-PeCB	C86				
55215-17-3	88-PeCB	CU	ND	pg/L	3.67	43.6
73575-57-2	89-PeCB	U	ND	pg/L	3.80	21.8
68194-07-0	90-PeCB	CU	ND	pg/L	5.26	65.5
68194-05-8	91-PeCB	C88				
52663-61-3	92-PeCB	U	ND	pg/L	3.58	21.8
73575-56-1	93-PeCB	CU	ND	pg/L	3.69	43.6
73575-55-0	94-PeCB	U	ND	pg/L	3.93	21.8
38379-99-6	95-PeCB	U	ND	pg/L	3.56	21.8
73575-54-9	96-PeCB	U	ND	pg/L	1.57	21.8

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
41464-51-1	97-PeCB	C86				
60233-25-2	98-PeCB	CU	ND	pg/L	3.75	43.6
38380-01-7	99-PeCB	U	ND	pg/L	3.30	21.8
39485-83-1	100-PeCB	C93				
37680-73-2	101-PeCB	C90				
68194-06-9	102-PeCB	C98				
60145-21-3	103-PeCB	U	ND	pg/L	3.43	21.8
56558-16-8	104-PeCB	U	ND	pg/L	1.62	21.8
32598-14-4	105-PeCB	U	ND	pg/L	2.68	21.8
70424-69-0	106-PeCB	U	ND	pg/L	2.58	21.8
70424-68-9	107-PeCB	U	ND	pg/L	2.55	21.8
70362-41-3	108-PeCB	CU	ND	pg/L	2.71	43.6
74472-35-8	109-PeCB	C86				
38380-03-9	110-PeCB	CJ	5.33	pg/L	2.55	43.6
39635-32-0	111-PeCB	U	ND	pg/L	2.51	21.8
74472-36-9	112-PeCB	U	ND	pg/L	2.60	21.8
68194-10-5	113-PeCB	C90				
74472-37-0	114-PeCB	U	ND	pg/L	2.84	21.8
74472-38-1	115-PeCB	C110				
18259-05-7	116-PeCB	C85				
68194-11-6	117-PeCB	C85				
31508-00-6	118-PeCB	U	ND	pg/L	4.34	21.8
56558-17-9	119-PeCB	C86				
68194-12-7	120-PeCB	U	ND	pg/L	2.29	21.8
56558-18-0	121-PeCB	U	ND	pg/L	2.79	21.8
76842-07-4	122-PeCB	U	ND	pg/L	2.77	21.8
65510-44-3	123-PeCB	U	ND	pg/L	2.77	21.8
70424-70-3	124-PeCB	C108				
74472-39-2	125-PeCB	C86				
57465-28-8	126-PeCB	U	ND	pg/L	2.68	21.8
39635-33-1	127-PeCB	U	ND	pg/L	2.51	21.8
38380-07-3	128-HxCB	CU	ND	pg/L	3.36	43.6

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
55215-18-4	129-HxCB	CJ	9.43	pg/L	3.78	65.5
52663-66-8	130-HxCB	U	ND	pg/L	4.32	21.8
61798-70-7	131-HxCB	U	ND	pg/L	4.98	21.8
38380-05-1	132-HxCB	U	ND	pg/L	4.60	21.8
35694-04-3	133-HxCB	U	ND	pg/L	4.21	21.8
52704-70-8	134-HxCB	U	ND	pg/L	5.41	21.8
52744-13-5	135-HxCB	CU	ND	pg/L	3.14	43.6
38411-22-2	136-HxCB	U	ND	pg/L	2.49	21.8
35694-06-5	137-HxCB	U	ND	pg/L	4.02	21.8
35065-28-2	138-HxCB	C129				
56030-56-9	139-HxCB	CU	ND	pg/L	4.15	43.6
59291-64-4	140-HxCB	C139				
52712-04-6	141-HxCB	U	ND	pg/L	3.99	21.8
41411-61-4	142-HxCB	U	ND	pg/L	4.39	21.8
68194-15-0	143-HxCB	U	ND	pg/L	4.28	21.8
68194-14-9	144-HxCB	U	ND	pg/L	3.03	21.8
74472-40-5	145-HxCB	U	ND	pg/L	2.64	21.8
51908-16-8	146-HxCB	U	ND	pg/L	3.78	21.8
68194-13-8	147-HxCB	CJ	4.58	pg/L	4.19	43.6
74472-41-6	148-HxCB	U	ND	pg/L	3.03	21.8
38380-04-0	149-HxCB	C147				
68194-08-1	150-HxCB	U	ND	pg/L	2.53	21.8
52663-63-5	151-HxCB	C135				
68194-09-2	152-HxCB	U	ND	pg/L	2.47	21.8
35065-27-1	153-HxCB	CJ	8.53	pg/L	3.27	43.6
60145-22-4	154-HxCB	U	ND	pg/L	2.75	21.8
33979-03-2	155-HxCB	U	ND	pg/L	2.51	21.8
38380-08-4	156-HxCB	CU	ND	pg/L	3.64	43.6
69782-90-7	157-HxCB	C156				
74472-42-7	158-HxCB	U	ND	pg/L	2.75	21.8
39635-35-3	159-HxCB	U	ND	pg/L	2.79	21.8
41411-62-5	160-HxCB	U	ND	pg/L	3.12	21.8

Comments:

C **Congener has coeluters. When Cxxx, refer to congener number xxx for data**

J **Value is estimated**

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
74472-43-8	161-HxCB	U	ND	pg/L	3.06	21.8
39635-34-2	162-HxCB	U	ND	pg/L	2.88	21.8
74472-44-9	163-HxCB	C129				
74472-45-0	164-HxCB	U	ND	pg/L	3.08	21.8
74472-46-1	165-HxCB	U	ND	pg/L	3.54	21.8
41411-63-6	166-HxCB	C128				
52663-72-6	167-HxCB	U	ND	pg/L	2.71	21.8
59291-65-5	168-HxCB	C153				
32774-16-6	169-HxCB	U	ND	pg/L	2.64	21.8
35065-30-6	170-HpCB	J	4.87	pg/L	3.54	21.8
52663-71-5	171-HpCB	CU	ND	pg/L	3.86	43.6
52663-74-8	172-HpCB	U	ND	pg/L	3.73	21.8
68194-16-1	173-HpCB	C171				
38411-25-5	174-HpCB	U	ND	pg/L	3.82	21.8
40186-70-7	175-HpCB	U	ND	pg/L	2.95	21.8
52663-65-7	176-HpCB	U	ND	pg/L	2.49	21.8
52663-70-4	177-HpCB	U	ND	pg/L	3.93	21.8
52663-67-9	178-HpCB	U	ND	pg/L	3.14	21.8
52663-64-6	179-HpCB	U	ND	pg/L	2.47	21.8
35065-29-3	180-HpCB	CJ	14.5	pg/L	3.10	43.6
74472-47-2	181-HpCB	U	ND	pg/L	3.84	21.8
60145-23-5	182-HpCB	U	ND	pg/L	2.95	21.8
52663-69-1	183-HpCB	CU	ND	pg/L	3.69	43.6
74472-48-3	184-HpCB	U	ND	pg/L	2.49	21.8
52712-05-7	185-HpCB	C183				
74472-49-4	186-HpCB	U	ND	pg/L	2.64	21.8
52663-68-0	187-HpCB	J	4.02	pg/L	2.92	21.8
74487-85-7	188-HpCB	U	ND	pg/L	2.53	21.8
39635-31-9	189-HpCB	U	ND	pg/L	3.43	21.8
41411-64-7	190-HpCB	U	ND	pg/L	2.77	21.8
74472-50-7	191-HpCB	U	ND	pg/L	2.75	21.8
74472-51-8	192-HpCB	U	ND	pg/L	3.08	21.8

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
69782-91-8	193-HpCB	C180				
35694-08-7	194-OcCB	J	4.60	pg/L	3.56	21.8
52663-78-2	195-OcCB	U	ND	pg/L	3.99	21.8
42740-50-1	196-OcCB	U	ND	pg/L	2.95	21.8
33091-17-7	197-OcCB	CU	ND	pg/L	2.47	43.6
68194-17-2	198-OcCB	CU	ND	pg/L	3.08	43.6
52663-75-9	199-OcCB	C198				
52663-73-7	200-OcCB	C197				
40186-71-8	201-OcCB	U	ND	pg/L	2.49	21.8
2136-99-4	202-OcCB	U	ND	pg/L	2.86	21.8
52663-76-0	203-OcCB	U	ND	pg/L	2.88	21.8
74472-52-9	204-OcCB	U	ND	pg/L	2.49	21.8
74472-53-0	205-OcCB	U	ND	pg/L	3.01	21.8
40186-72-9	206-NoCB	U	ND	pg/L	3.58	21.8
52663-79-3	207-NoCB	U	ND	pg/L	3.10	21.8
52663-77-1	208-NoCB	U	ND	pg/L	3.03	21.8
2051-24-3	209-DeCB	U	ND	pg/L	3.60	21.8
1336-36-3	Total PCB Congeners	J	127	pg/L	7.29	21.8

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		1050	2180	pg/L	48.1	(15%-150%)
13C-3-MoCB		1220	2180	pg/L	56.0	(15%-150%)
13C-4-DiCB		1290	2180	pg/L	59.3	(25%-150%)
13C-15-DiCB		1690	2180	pg/L	77.2	(25%-150%)
13C-19-TrCB		1580	2180	pg/L	72.5	(25%-150%)
13C-37-TrCB		1840	2180	pg/L	84.1	(25%-150%)
13C-54-TeCB		1820	2180	pg/L	83.5	(25%-150%)
13C-77-TeCB		2580	2180	pg/L	118	(25%-150%)
13C-81-TeCB		2490	2180	pg/L	114	(25%-150%)
13C-104-PeCB		1820	2180	pg/L	83.5	(25%-150%)
13C-105-PeCB		2290	2180	pg/L	105	(25%-150%)
13C-114-PeCB		2230	2180	pg/L	102	(25%-150%)
13C-118-PeCB		2230	2180	pg/L	102	(25%-150%)
13C-123-PeCB		2250	2180	pg/L	103	(25%-150%)
13C-126-PeCB		2790	2180	pg/L	128	(25%-150%)
13C-155-HxCB		1360	2180	pg/L	62.2	(25%-150%)
13C-156-HxCB	C	4210	4360	pg/L	96.3	(25%-150%)
13C-157-HxCB	C156L					
13C-167-HxCB		2060	2180	pg/L	94.3	(25%-150%)
13C-169-HxCB		2440	2180	pg/L	112	(25%-150%)
13C-188-HpCB		1210	2180	pg/L	55.4	(25%-150%)
13C-189-HpCB		1650	2180	pg/L	75.5	(25%-150%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143001**	**Date Collected:**	**07/27/2017 12:30**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-001K Rio Grande-North-2**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/13/2017 13:53**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_2-11**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**916.4 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		1430	2180	pg/L	65.7	(25%-150%)
13C-205-OcCB		2040	2180	pg/L	93.5	(25%-150%)
13C-206-NoCB		2330	2180	pg/L	107	(25%-150%)
13C-208-NoCB		1880	2180	pg/L	86.0	(25%-150%)
13C-209-DeCB		2430	2180	pg/L	112	(25%-150%)
13C-28-TrCB		1710	2180	pg/L	78.4	(30%-135%)
13C-111-PeCB		2040	2180	pg/L	93.5	(30%-135%)
13C-178-HpCB		2100	2180	pg/L	96.0	(30%-135%)

Comments:

C **Congener has coeluters. When Cxxx, refer to congener number xxx for data**

J **Value is estimated**

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB	U	ND	pg/L	5.56	22.1
2051-61-8	2-MoCB	U	ND	pg/L	5.23	22.1
2051-62-9	3-MoCB	U	ND	pg/L	4.41	22.1
13029-08-8	4-DiCB	U	ND	pg/L	14.3	22.1
16605-91-7	5-DiCB	U	ND	pg/L	7.31	22.1
25569-80-6	6-DiCB	U	ND	pg/L	5.63	22.1
33284-50-3	7-DiCB	U	ND	pg/L	6.16	22.1
34883-43-7	8-DiCB	U	ND	pg/L	4.90	22.1
34883-39-1	9-DiCB	U	ND	pg/L	6.58	22.1
33146-45-1	10-DiCB	U	ND	pg/L	7.35	22.1
2050-67-1	11-DiCB	U	ND	pg/L	48.4	110
2974-92-7	12-DiCB	CU	ND	pg/L	5.92	44.1
2974-90-5	13-DiCB	C12				
34883-41-5	14-DiCB	U	ND	pg/L	6.00	22.1
2050-68-2	15-DiCB	U	ND	pg/L	5.56	22.1
38444-78-9	16-TrCB	U	ND	pg/L	3.47	22.1
37680-66-3	17-TrCB	U	ND	pg/L	3.55	22.1
37680-65-2	18-TrCB	CU	ND	pg/L	4.52	44.1
38444-73-4	19-TrCB	U	ND	pg/L	4.22	22.1
38444-84-7	20-TrCB	CJ	5.76	pg/L	2.38	44.1
55702-46-0	21-TrCB	CU	ND	pg/L	2.32	44.1
38444-85-8	22-TrCB	U	ND	pg/L	2.38	22.1
55720-44-0	23-TrCB	U	ND	pg/L	2.47	22.1
55702-45-9	24-TrCB	U	ND	pg/L	2.83	22.1
55712-37-3	25-TrCB	U	ND	pg/L	2.10	22.1
38444-81-4	26-TrCB	CU	ND	pg/L	2.36	44.1
38444-76-7	27-TrCB	U	ND	pg/L	2.58	22.1
7012-37-5	28-TrCB	C20				
15862-07-4	29-TrCB	C26				
35693-92-6	30-TrCB	C18				
16606-02-3	31-TrCB	U	ND	pg/L	4.68	22.1
38444-77-8	32-TrCB	U	ND	pg/L	2.34	22.1

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
38444-86-9	33-TrCB	C21				
37680-68-5	34-TrCB	U	ND	pg/L	2.58	22.1
37680-69-6	35-TrCB	U	ND	pg/L	3.47	22.1
38444-87-0	36-TrCB	U	ND	pg/L	3.44	22.1
38444-90-5	37-TrCB	U	ND	pg/L	3.40	22.1
53555-66-1	38-TrCB	U	ND	pg/L	3.44	22.1
38444-88-1	39-TrCB	U	ND	pg/L	3.38	22.1
38444-93-8	40-TeCB	CU	ND	pg/L	3.55	44.1
52663-59-9	41-TeCB	U	ND	pg/L	4.55	22.1
36559-22-5	42-TeCB	U	ND	pg/L	3.82	22.1
70362-46-8	43-TeCB	U	ND	pg/L	4.64	22.1
41464-39-5	44-TeCB	CJ	7.73	pg/L	3.62	66.2
70362-45-7	45-TeCB	CJ	2.45	pg/L	2.19	44.1
41464-47-5	46-TeCB	U	ND	pg/L	2.32	22.1
2437-79-8	47-TeCB	C44				
70362-47-9	48-TeCB	U	ND	pg/L	4.02	22.1
41464-40-8	49-TeCB	CJ	3.93	pg/L	3.42	44.1
62796-65-0	50-TeCB	CU	ND	pg/L	2.07	44.1
68194-04-7	51-TeCB	C45				
35693-99-3	52-TeCB	J	8.45	pg/L	3.97	22.1
41464-41-9	53-TeCB	C50				
15968-05-5	54-TeCB	U	ND	pg/L	1.52	22.1
74338-24-2	55-TeCB	U	ND	pg/L	1.79	22.1
41464-43-1	56-TeCB	U	ND	pg/L	1.90	22.1
70424-67-8	57-TeCB	U	ND	pg/L	1.81	22.1
41464-49-7	58-TeCB	U	ND	pg/L	1.92	22.1
74472-33-6	59-TeCB	CU	ND	pg/L	2.94	66.2
33025-41-1	60-TeCB	U	ND	pg/L	1.77	22.1
33284-53-6	61-TeCB	CJ	7.33	pg/L	1.77	88.3
54230-22-7	62-TeCB	C59				
74472-34-7	63-TeCB	U	ND	pg/L	1.68	22.1
52663-58-8	64-TeCB	U	ND	pg/L	2.87	22.1

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
33284-54-7	65-TeCB	C44				
32598-10-0	66-TeCB	U	ND	pg/L	3.05	22.1
73575-53-8	67-TeCB	U	ND	pg/L	1.63	22.1
73575-52-7	68-TeCB	U	ND	pg/L	1.72	22.1
60233-24-1	69-TeCB	C49				
32598-11-1	70-TeCB	C61				
41464-46-4	71-TeCB	C40				
41464-42-0	72-TeCB	U	ND	pg/L	1.74	22.1
74338-23-1	73-TeCB	U	ND	pg/L	3.16	22.1
32690-93-0	74-TeCB	C61				
32598-12-2	75-TeCB	C59				
70362-48-0	76-TeCB	C61				
32598-13-3	77-TeCB	U	ND	pg/L	1.59	22.1
70362-49-1	78-TeCB	U	ND	pg/L	1.55	22.1
41464-48-6	79-TeCB	U	ND	pg/L	1.41	22.1
33284-52-5	80-TeCB	U	ND	pg/L	1.52	22.1
70362-50-4	81-TeCB	U	ND	pg/L	1.50	22.1
52663-62-4	82-PeCB	U	ND	pg/L	2.43	22.1
60145-20-2	83-PeCB	U	ND	pg/L	2.76	22.1
52663-60-2	84-PeCB	U	ND	pg/L	2.78	22.1
65510-45-4	85-PeCB	CU	ND	pg/L	1.90	66.2
55312-69-1	86-PeCB	CJ	5.85	pg/L	2.03	132
38380-02-8	87-PeCB	C86				
55215-17-3	88-PeCB	CU	ND	pg/L	2.63	44.1
73575-57-2	89-PeCB	U	ND	pg/L	2.63	22.1
68194-07-0	90-PeCB	CU	ND	pg/L	9.78	66.2
68194-05-8	91-PeCB	C88				
52663-61-3	92-PeCB	U	ND	pg/L	2.47	22.1
73575-56-1	93-PeCB	CU	ND	pg/L	2.65	44.1
73575-55-0	94-PeCB	U	ND	pg/L	2.94	22.1
38379-99-6	95-PeCB	J	7.50	pg/L	2.54	22.1
73575-54-9	96-PeCB	U	ND	pg/L	1.13	22.1

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
41464-51-1	97-PeCB	C86				
60233-25-2	98-PeCB	CU	ND	pg/L	2.69	44.1
38380-01-7	99-PeCB	U	ND	pg/L	3.11	22.1
39485-83-1	100-PeCB	C93				
37680-73-2	101-PeCB	C90				
68194-06-9	102-PeCB	C98				
60145-21-3	103-PeCB	U	ND	pg/L	2.47	22.1
56558-16-8	104-PeCB	U	ND	pg/L	0.905	22.1
32598-14-4	105-PeCB	U	ND	pg/L	2.94	22.1
70424-69-0	106-PeCB	U	ND	pg/L	1.72	22.1
70424-68-9	107-PeCB	U	ND	pg/L	1.68	22.1
70362-41-3	108-PeCB	CU	ND	pg/L	1.85	44.1
74472-35-8	109-PeCB	C86				
38380-03-9	110-PeCB	CU	ND	pg/L	10.4	44.1
39635-32-0	111-PeCB	U	ND	pg/L	1.70	22.1
74472-36-9	112-PeCB	U	ND	pg/L	1.72	22.1
68194-10-5	113-PeCB	C90				
74472-37-0	114-PeCB	U	ND	pg/L	2.03	22.1
74472-38-1	115-PeCB	C110				
18259-05-7	116-PeCB	C85				
68194-11-6	117-PeCB	C85				
31508-00-6	118-PeCB	U	ND	pg/L	6.51	22.1
56558-17-9	119-PeCB	C86				
68194-12-7	120-PeCB	U	ND	pg/L	1.55	22.1
56558-18-0	121-PeCB	U	ND	pg/L	1.90	22.1
76842-07-4	122-PeCB	U	ND	pg/L	1.85	22.1
65510-44-3	123-PeCB	U	ND	pg/L	1.92	22.1
70424-70-3	124-PeCB	C108				
74472-39-2	125-PeCB	C86				
57465-28-8	126-PeCB	U	ND	pg/L	2.03	22.1
39635-33-1	127-PeCB	U	ND	pg/L	1.59	22.1
38380-07-3	128-HxCB	CU	ND	pg/L	2.30	44.1

Comments:

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PCB Congeners
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Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
55215-18-4	129-HxCB	CJ	21.1	pg/L	2.58	66.2
52663-66-8	130-HxCB	U	ND	pg/L	2.94	22.1
61798-70-7	131-HxCB	U	ND	pg/L	3.44	22.1
38380-05-1	132-HxCB	J	5.78	pg/L	3.29	22.1
35694-04-3	133-HxCB	U	ND	pg/L	2.94	22.1
52704-70-8	134-HxCB	U	ND	pg/L	3.95	22.1
52744-13-5	135-HxCB	CJ	7.68	pg/L	1.90	44.1
38411-22-2	136-HxCB	U	ND	pg/L	2.03	22.1
35694-06-5	137-HxCB	U	ND	pg/L	2.96	22.1
35065-28-2	138-HxCB	C129				
56030-56-9	139-HxCB	CU	ND	pg/L	2.91	44.1
59291-64-4	140-HxCB	C139				
52712-04-6	141-HxCB	J	4.55	pg/L	2.67	22.1
41411-61-4	142-HxCB	U	ND	pg/L	3.16	22.1
68194-15-0	143-HxCB	U	ND	pg/L	2.91	22.1
68194-14-9	144-HxCB	U	ND	pg/L	1.77	22.1
74472-40-5	145-HxCB	U	ND	pg/L	1.66	22.1
51908-16-8	146-HxCB	J	3.24	pg/L	2.54	22.1
68194-13-8	147-HxCB	CJ	16.0	pg/L	2.96	44.1
74472-41-6	148-HxCB	U	ND	pg/L	1.83	22.1
38380-04-0	149-HxCB	C147				
68194-08-1	150-HxCB	U	ND	pg/L	1.59	22.1
52663-63-5	151-HxCB	C135				
68194-09-2	152-HxCB	U	ND	pg/L	1.55	22.1
35065-27-1	153-HxCB	CJ	23.8	pg/L	2.30	44.1
60145-22-4	154-HxCB	U	ND	pg/L	1.63	22.1
33979-03-2	155-HxCB	U	ND	pg/L	1.17	22.1
38380-08-4	156-HxCB	CJ	2.14	pg/L	2.05	44.1
69782-90-7	157-HxCB	C156				
74472-42-7	158-HxCB	U	ND	pg/L	2.16	22.1
39635-35-3	159-HxCB	U	ND	pg/L	1.48	22.1
41411-62-5	160-HxCB	U	ND	pg/L	2.23	22.1

Comments:

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Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
74472-43-8	161-HxCB	U	ND	pg/L	2.14	22.1
39635-34-2	162-HxCB	U	ND	pg/L	1.50	22.1
74472-44-9	163-HxCB	C129				
74472-45-0	164-HxCB	U	ND	pg/L	2.05	22.1
74472-46-1	165-HxCB	U	ND	pg/L	2.43	22.1
41411-63-6	166-HxCB	C128				
52663-72-6	167-HxCB	U	ND	pg/L	1.55	22.1
59291-65-5	168-HxCB	C153				
32774-16-6	169-HxCB	U	ND	pg/L	1.50	22.1
35065-30-6	170-HpCB	J	8.45	pg/L	2.38	22.1
52663-71-5	171-HpCB	CJ	2.87	pg/L	2.56	44.1
52663-74-8	172-HpCB	U	ND	pg/L	2.47	22.1
68194-16-1	173-HpCB	C171				
38411-25-5	174-HpCB	J	7.50	pg/L	2.49	22.1
40186-70-7	175-HpCB	U	ND	pg/L	1.52	22.1
52663-65-7	176-HpCB	U	ND	pg/L	1.35	22.1
52663-70-4	177-HpCB	U	ND	pg/L	5.14	22.1
52663-67-9	178-HpCB	U	ND	pg/L	2.14	22.1
52663-64-6	179-HpCB	U	ND	pg/L	3.38	22.1
35065-29-3	180-HpCB	CJ	24.1	pg/L	2.07	44.1
74472-47-2	181-HpCB	U	ND	pg/L	2.52	22.1
60145-23-5	182-HpCB	U	ND	pg/L	1.52	22.1
52663-69-1	183-HpCB	CJ	6.91	pg/L	2.49	44.1
74472-48-3	184-HpCB	U	ND	pg/L	1.32	22.1
52712-05-7	185-HpCB	C183				
74472-49-4	186-HpCB	U	ND	pg/L	1.39	22.1
52663-68-0	187-HpCB	J	9.40	pg/L	1.52	22.1
74487-85-7	188-HpCB	U	ND	pg/L	1.24	22.1
39635-31-9	189-HpCB	U	ND	pg/L	1.48	22.1
41411-64-7	190-HpCB	J	2.52	pg/L	1.85	22.1
74472-50-7	191-HpCB	U	ND	pg/L	1.83	22.1
74472-51-8	192-HpCB	U	ND	pg/L	2.03	22.1

Comments:

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PCB Congeners
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Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
69782-91-8	193-HpCB	C180				
35694-08-7	194-OcCB	J	5.92	pg/L	1.48	22.1
52663-78-2	195-OcCB	U	ND	pg/L	1.88	22.1
42740-50-1	196-OcCB	J	3.18	pg/L	1.63	22.1
33091-17-7	197-OcCB	CU	ND	pg/L	1.37	44.1
68194-17-2	198-OcCB	CJ	4.99	pg/L	1.70	44.1
52663-75-9	199-OcCB	C198				
52663-73-7	200-OcCB	C197				
40186-71-8	201-OcCB	U	ND	pg/L	1.37	22.1
2136-99-4	202-OcCB	U	ND	pg/L	1.50	22.1
52663-76-0	203-OcCB	J	3.93	pg/L	1.61	22.1
74472-52-9	204-OcCB	U	ND	pg/L	1.37	22.1
74472-53-0	205-OcCB	U	ND	pg/L	1.28	22.1
40186-72-9	206-NoCB	J	2.27	pg/L	1.41	22.1
52663-79-3	207-NoCB	U	ND	pg/L	1.19	22.1
52663-77-1	208-NoCB	U	ND	pg/L	1.13	22.1
2051-24-3	209-DeCB	U	ND	pg/L	2.30	22.1
1336-36-3	Total PCB Congeners	J	215	pg/L	7.37	22.1

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		990	2210	pg/L	44.9	(15%-150%)
13C-3-MoCB		1200	2210	pg/L	54.3	(15%-150%)
13C-4-DiCB		1300	2210	pg/L	59.0	(25%-150%)
13C-15-DiCB		2240	2210	pg/L	101	(25%-150%)
13C-19-TrCB		1800	2210	pg/L	81.7	(25%-150%)
13C-37-TrCB		1980	2210	pg/L	89.6	(25%-150%)
13C-54-TeCB		1720	2210	pg/L	78.1	(25%-150%)
13C-77-TeCB		2570	2210	pg/L	117	(25%-150%)
13C-81-TeCB		2510	2210	pg/L	114	(25%-150%)
13C-104-PeCB		1880	2210	pg/L	85.3	(25%-150%)
13C-105-PeCB		2040	2210	pg/L	92.4	(25%-150%)
13C-114-PeCB		2040	2210	pg/L	92.4	(25%-150%)
13C-118-PeCB		2070	2210	pg/L	93.9	(25%-150%)
13C-123-PeCB		2100	2210	pg/L	95.3	(25%-150%)
13C-126-PeCB		2400	2210	pg/L	109	(25%-150%)
13C-155-HxCB		1600	2210	pg/L	72.3	(25%-150%)
13C-156-HxCB	C	3970	4410	pg/L	89.9	(25%-150%)
13C-157-HxCB	C156L					
13C-167-HxCB		1970	2210	pg/L	89.3	(25%-150%)
13C-169-HxCB		2260	2210	pg/L	102	(25%-150%)
13C-188-HpCB		1440	2210	pg/L	65.1	(25%-150%)
13C-189-HpCB		1670	2210	pg/L	75.6	(25%-150%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**11143002**	**Date Collected:**	**07/28/2017 08:45**	**Matrix:**	**WATER**
Client Sample:	**1668A Water**	**Date Received:**	**08/01/2017 10:00**		
Client ID:	**1707E46-003K Rio Grande-South-20**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/14/2017 00:19**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a_3-9**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**906.1 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		1570	2210	pg/L	71.3	(25%-150%)
13C-205-OcCB		2040	2210	pg/L	92.3	(25%-150%)
13C-206-NoCB		2340	2210	pg/L	106	(25%-150%)
13C-208-NoCB		1940	2210	pg/L	87.8	(25%-150%)
13C-209-DeCB		2440	2210	pg/L	110	(25%-150%)
13C-28-TrCB		1700	2210	pg/L	77.0	(30%-135%)
13C-111-PeCB		1990	2210	pg/L	90.1	(30%-135%)
13C-178-HpCB		2130	2210	pg/L	96.7	(30%-135%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

U Analyte was analyzed for, but not detected above the specified detection limit.

Quality Control Summary

PCB Congeners
Surrogate Recovery Report

SDG Number: 1707E46

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12019229	LCS for batch 35297	13C-1-MoCB		44.5	(15%-140%)
		13C-3-MoCB		51.5	(15%-140%)
		13C-4-DiCB		52.6	(30%-140%)
		13C-15-DiCB		69.2	(30%-140%)
		13C-19-TrCB		62.6	(30%-140%)
		13C-37-TrCB		77.7	(30%-140%)
		13C-54-TeCB		75.1	(30%-140%)
		13C-77-TeCB		110	(30%-140%)
		13C-81-TeCB		106	(30%-140%)
		13C-104-PeCB		68.5	(30%-140%)
		13C-105-PeCB		89.9	(30%-140%)
		13C-114-PeCB		88.8	(30%-140%)
		13C-118-PeCB		88.3	(30%-140%)
		13C-123-PeCB		89.1	(30%-140%)
		13C-126-PeCB		115	(30%-140%)
		13C-155-HxCB		49.6	(30%-140%)
		13C-156-HxCB	C	84.3	(30%-140%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		80.4	(30%-140%)
		13C-169-HxCB		103	(30%-140%)
		13C-188-HpCB		40.6	(30%-140%)
		13C-189-HpCB		64.2	(30%-140%)
		13C-202-OcCB		50.0	(30%-140%)
		13C-205-OcCB		79.1	(30%-140%)
		13C-206-NoCB		92.4	(30%-140%)
		13C-208-NoCB		70.3	(30%-140%)
		13C-209-DeCB		96.1	(30%-140%)
		13C-28-TrCB		66.6	(40%-125%)
		13C-111-PeCB		81.2	(40%-125%)
		13C-178-HpCB		80.7	(40%-125%)
12019230	LCSD for batch 35297	13C-1-MoCB		51.4	(15%-140%)
		13C-3-MoCB		59.6	(15%-140%)
		13C-4-DiCB		59.3	(30%-140%)
		13C-15-DiCB		75.9	(30%-140%)
		13C-19-TrCB		73.5	(30%-140%)
		13C-37-TrCB		79.5	(30%-140%)
		13C-54-TeCB		84.8	(30%-140%)
		13C-77-TeCB		113	(30%-140%)
		13C-81-TeCB		111	(30%-140%)
		13C-104-PeCB		81.5	(30%-140%)
		13C-105-PeCB		108	(30%-140%)
		13C-114-PeCB		107	(30%-140%)
		13C-118-PeCB		104	(30%-140%)
		13C-123-PeCB		106	(30%-140%)
		13C-126-PeCB		141 *	(30%-140%)
		13C-155-HxCB		57.1	(30%-140%)
		13C-156-HxCB	C	107	(30%-140%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		100	(30%-140%)
		13C-169-HxCB		134	(30%-140%)
		13C-188-HpCB		41.2	(30%-140%)
		13C-189-HpCB		73.7	(30%-140%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1707E46

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12019230	LCSD for batch 35297	13C-202-OcCB		52.7	(30%-140%)
		13C-205-OcCB		93.1	(30%-140%)
		13C-206-NoCB		110	(30%-140%)
		13C-208-NoCB		79.9	(30%-140%)
		13C-209-DeCB		116	(30%-140%)
		13C-28-TrCB		74.7	(40%-125%)
		13C-111-PeCB		93.2	(40%-125%)
		13C-178-HpCB		95.2	(40%-125%)
12019228	MB for batch 35297	13C-1-MoCB		56.2	(15%-150%)
		13C-3-MoCB		61.6	(15%-150%)
		13C-4-DiCB		62.6	(25%-150%)
		13C-15-DiCB		84.6	(25%-150%)
		13C-19-TrCB		73.9	(25%-150%)
		13C-37-TrCB		95.7	(25%-150%)
		13C-54-TeCB		84.1	(25%-150%)
		13C-77-TeCB		130	(25%-150%)
		13C-81-TeCB		129	(25%-150%)
		13C-104-PeCB		80.5	(25%-150%)
		13C-105-PeCB		110	(25%-150%)
		13C-114-PeCB		107	(25%-150%)
		13C-118-PeCB		107	(25%-150%)
		13C-123-PeCB		108	(25%-150%)
		13C-126-PeCB		140	(25%-150%)
		13C-155-HxCB		58.5	(25%-150%)
		13C-156-HxCB	C	99.7	(25%-150%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		96.2	(25%-150%)
		13C-169-HxCB		121	(25%-150%)
		13C-188-HpCB		46.8	(25%-150%)
		13C-189-HpCB		73.6	(25%-150%)
		13C-202-OcCB		58.3	(25%-150%)
		13C-205-OcCB		93.2	(25%-150%)
		13C-206-NoCB		109	(25%-150%)
		13C-208-NoCB		81.2	(25%-150%)
		13C-209-DeCB		113	(25%-150%)
		13C-28-TrCB		76.8	(30%-135%)
		13C-111-PeCB		96.9	(30%-135%)
		13C-178-HpCB		96.3	(30%-135%)
11143001	1707E46-001K Rio Grande-North-20170727	13C-1-MoCB		48.1	(15%-150%)
		13C-3-MoCB		56.0	(15%-150%)
		13C-4-DiCB		59.3	(25%-150%)
		13C-15-DiCB		77.2	(25%-150%)
		13C-19-TrCB		72.5	(25%-150%)
		13C-37-TrCB		84.1	(25%-150%)
		13C-54-TeCB		83.5	(25%-150%)
		13C-77-TeCB		118	(25%-150%)
		13C-81-TeCB		114	(25%-150%)
		13C-104-PeCB		83.5	(25%-150%)
		13C-105-PeCB		105	(25%-150%)
		13C-114-PeCB		102	(25%-150%)
		13C-118-PeCB		102	(25%-150%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1707E46

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
11143001	1707E46-001K Rio Grande-North-20170727	13C-123-PeCB		103	(25%-150%)
		13C-126-PeCB		128	(25%-150%)
		13C-155-HxCB		62.2	(25%-150%)
		13C-156-HxCB	C	96.3	(25%-150%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		94.3	(25%-150%)
		13C-169-HxCB		112	(25%-150%)
		13C-188-HpCB		55.4	(25%-150%)
		13C-189-HpCB		75.5	(25%-150%)
		13C-202-OcCB		65.7	(25%-150%)
		13C-205-OcCB		93.5	(25%-150%)
		13C-206-NoCB		107	(25%-150%)
		13C-208-NoCB		86.0	(25%-150%)
		13C-209-DeCB		112	(25%-150%)
		13C-28-TrCB		78.4	(30%-135%)
		13C-111-PeCB		93.5	(30%-135%)
		13C-178-HpCB		96.0	(30%-135%)
11143002	1707E46-003K Rio Grande-South-20170728	13C-1-MoCB		44.9	(15%-150%)
		13C-3-MoCB		54.3	(15%-150%)
		13C-4-DiCB		59.0	(25%-150%)
		13C-15-DiCB		101	(25%-150%)
		13C-19-TrCB		81.7	(25%-150%)
		13C-37-TrCB		89.6	(25%-150%)
		13C-54-TeCB		78.1	(25%-150%)
		13C-77-TeCB		117	(25%-150%)
		13C-81-TeCB		114	(25%-150%)
		13C-104-PeCB		85.3	(25%-150%)
		13C-105-PeCB		92.4	(25%-150%)
		13C-114-PeCB		92.4	(25%-150%)
		13C-118-PeCB		93.9	(25%-150%)
		13C-123-PeCB		95.3	(25%-150%)
		13C-126-PeCB		109	(25%-150%)
		13C-155-HxCB		72.3	(25%-150%)
		13C-156-HxCB	C	89.9	(25%-150%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		89.3	(25%-150%)
		13C-169-HxCB		102	(25%-150%)
		13C-188-HpCB		65.1	(25%-150%)
		13C-189-HpCB		75.6	(25%-150%)
		13C-202-OcCB		71.3	(25%-150%)
		13C-205-OcCB		92.3	(25%-150%)
		13C-206-NoCB		106	(25%-150%)
		13C-208-NoCB		87.8	(25%-150%)
		13C-209-DeCB		110	(25%-150%)
		13C-28-TrCB		77.0	(30%-135%)
		13C-111-PeCB		90.1	(30%-135%)
		13C-178-HpCB		96.7	(30%-135%)

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

PCB Congeners

Quality Control Summary
Spike Recovery Report

SDG Number: 1707E46
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 35297
Matrix: WATER
Lab Sample ID: 12019229
Instrument: HRP791
Analysis Date: 08/12/2017 14:59
Dilution: 1
Analyst: MLS
Prep Batch ID: 35297
Batch ID: 35299

CAS No.		Parmname	Amount Added pg/L		Spike Conc. pg/L	Recovery %	Acceptance Limits
2051-60-7	LCS	1-MoCB	500		469	93.9	50-150
2051-62-9	LCS	3-MoCB	500		521	104	50-150
13029-08-8	LCS	4-DiCB	500		444	88.7	50-150
2050-68-2	LCS	15-DiCB	500		584	117	50-150
38444-73-4	LCS	19-TrCB	500		475	95	50-150
38444-90-5	LCS	37-TrCB	500		461	92.2	50-150
15968-05-5	LCS	54-TeCB	1000		853	85.3	50-150
32598-13-3	LCS	77-TeCB	1000		923	92.3	50-150
70362-50-4	LCS	81-TeCB	1000		1000	100	50-150
56558-16-8	LCS	104-PeCB	1000		863	86.3	50-150
32598-14-4	LCS	105-PeCB	1000		1090	109	50-150
74472-37-0	LCS	114-PeCB	1000		1050	105	50-150
31508-00-6	LCS	118-PeCB	1000		1020	102	50-150
65510-44-3	LCS	123-PeCB	1000		987	98.7	50-150
57465-28-8	LCS	126-PeCB	1000		1080	108	50-150
33979-03-2	LCS	155-HxCB	1000		941	94.1	50-150
38380-08-4	LCS	156-HxCB	2000	C	2250	113	50-150
69782-90-7	LCS	157-HxCB		C156			
52663-72-6	LCS	167-HxCB	1000		1150	115	50-150
32774-16-6	LCS	169-HxCB	1000		1050	105	50-150
74487-85-7	LCS	188-HpCB	1000		927	92.7	50-150
39635-31-9	LCS	189-HpCB	1000		1090	109	50-150
2136-99-4	LCS	202-OcCB	1500		1460	97.4	50-150
74472-53-0	LCS	205-OcCB	1500		1430	95.5	50-150
40186-72-9	LCS	206-NoCB	1500		1330	88.8	50-150
52663-77-1	LCS	208-NoCB	1500		1460	97.7	50-150
2051-24-3	LCS	209-DeCB	1500		1450	97	50-150

PCB Congeners
Quality Control Summary
Spike Recovery Report

SDG Number:	**1707E46**	**Sample Type:**	**Laboratory Control Sample Duplicate**
Client ID:	**LCSD for batch 35297**	**Matrix:**	**WATER**
Lab Sample ID:	**12019230**		
Instrument:	**HRP791**	**Analysis Date:**	**08/12/2017 16:07** **Dilution: 1**
Analyst:	**MLS**	**Prep Batch ID:**	**35297**
		Batch ID:	**35299**

CAS No.		Parmname	Amount Added pg/L		Spike Conc. pg/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
2051-60-7	LCSD	1-MoCB	500		452	90.4	50-150	3.81	0-20
2051-62-9	LCSD	3-MoCB	500		528	106	50-150	1.35	0-20
13029-08-8	LCSD	4-DiCB	500		464	92.8	50-150	4.50	0-20
2050-68-2	LCSD	15-DiCB	500		673	135	50-150	14.1	0-20
38444-73-4	LCSD	19-TrCB	500		485	97	50-150	2.02	0-20
38444-90-5	LCSD	37-TrCB	500		468	93.5	50-150	1.42	0-20
15968-05-5	LCSD	54-TeCB	1000		901	90.1	50-150	5.54	0-20
32598-13-3	LCSD	77-TeCB	1000		948	94.8	50-150	2.67	0-20
70362-50-4	LCSD	81-TeCB	1000		1010	101	50-150	0.587	0-20
56558-16-8	LCSD	104-PeCB	1000		943	94.3	50-150	8.95	0-20
32598-14-4	LCSD	105-PeCB	1000		1100	110	50-150	0.303	0-20
74472-37-0	LCSD	114-PeCB	1000		1070	107	50-150	1.24	0-20
31508-00-6	LCSD	118-PeCB	1000		1030	103	50-150	0.671	0-20
65510-44-3	LCSD	123-PeCB	1000		985	98.5	50-150	0.172	0-20
57465-28-8	LCSD	126-PeCB	1000		1110	111	50-150	2.62	0-20
33979-03-2	LCSD	155-HxCB	1000		935	93.5	50-150	0.663	0-20
38380-08-4	LCSD	156-HxCB	2000	C	2260	113	50-150	0.0843	0-20
69782-90-7	LCSD	157-HxCB		C156					
52663-72-6	LCSD	167-HxCB	1000		1130	113	50-150	1.48	0-20
32774-16-6	LCSD	169-HxCB	1000		1060	106	50-150	0.252	0-20
74487-85-7	LCSD	188-HpCB	1000		913	91.3	50-150	1.55	0-20
39635-31-9	LCSD	189-HpCB	1000		1090	109	50-150	0.0976	0-20
2136-99-4	LCSD	202-OcCB	1500		1460	97.6	50-150	0.242	0-20
74472-53-0	LCSD	205-OcCB	1500		1430	95.1	50-150	0.439	0-20
40186-72-9	LCSD	206-NoCB	1500		1330	88.7	50-150	0.101	0-20
52663-77-1	LCSD	208-NoCB	1500		1470	98.1	50-150	0.412	0-20
2051-24-3	LCSD	209-DeCB	1500		1440	96.1	50-150	0.950	0-20

Method Blank Summary

SDG Number: **1707E46**
Client ID: **MB for batch 35297**
Lab Sample ID: **12019228**
Column:

Client: **HALL001**
Instrument ID: **HRP791**
Prep Date: **08-AUG-17**

Matrix: **WATER**
Data File: **c12aug17a-4**
Analyzed: **08/12/17 17:15**

This method blank applies to the following samples and quality control samples:

	Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01	LCS for batch 35297	12019229	c12aug17a-2	08/12/17	1459
02	LCSD for batch 35297	12019230	c12aug17a-3	08/12/17	1607
03	1707E46-001K Rio Grande-North-20170727	11143001	c12aug17a_2-11	08/13/17	1353
04	1707E46-003K Rio Grande-South-20170728	11143002	c12aug17a_3-9	08/14/17	0019

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB	U	ND	pg/L	7.00	40.0
2051-61-8	2-MoCB	U	ND	pg/L	7.02	40.0
2051-62-9	3-MoCB	U	ND	pg/L	6.42	20.0
13029-08-8	4-DiCB	U	ND	pg/L	41.3	40.0
16605-91-7	5-DiCB	U	ND	pg/L	24.9	40.0
25569-80-6	6-DiCB	U	ND	pg/L	20.3	20.0
33284-50-3	7-DiCB	U	ND	pg/L	23.5	40.0
34883-43-7	8-DiCB	U	ND	pg/L	19.1	40.0
34883-39-1	9-DiCB	U	ND	pg/L	25.1	40.0
33146-45-1	10-DiCB	U	ND	pg/L	23.9	40.0
2050-67-1	11-DiCB	U	ND	pg/L	24.3	100
2974-92-7	12-DiCB	CU	ND	pg/L	23.7	40.0
2974-90-5	13-DiCB	C12				
34883-41-5	14-DiCB	U	ND	pg/L	23.2	40.0
2050-68-2	15-DiCB	U	ND	pg/L	23.3	20.0
38444-78-9	16-TrCB	U	ND	pg/L	7.84	20.0
37680-66-3	17-TrCB	U	ND	pg/L	7.70	20.0
37680-65-2	18-TrCB	CU	ND	pg/L	6.60	40.0
38444-73-4	19-TrCB	U	ND	pg/L	8.52	40.0
38444-84-7	20-TrCB	CU	ND	pg/L	5.58	40.0
55702-46-0	21-TrCB	CU	ND	pg/L	5.36	40.0
38444-85-8	22-TrCB	U	ND	pg/L	5.50	20.0
55720-44-0	23-TrCB	U	ND	pg/L	5.68	20.0
55702-45-9	24-TrCB	U	ND	pg/L	5.78	40.0
55712-37-3	25-TrCB	U	ND	pg/L	4.86	20.0
38444-81-4	26-TrCB	CU	ND	pg/L	5.40	40.0
38444-76-7	27-TrCB	U	ND	pg/L	5.82	20.0
7012-37-5	28-TrCB	C20				
15862-07-4	29-TrCB	C26				
35693-92-6	30-TrCB	C18				
16606-02-3	31-TrCB	U	ND	pg/L	4.98	20.0
38444-77-8	32-TrCB	U	ND	pg/L	5.18	20.0

Comments:
C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
38444-86-9	33-TrCB	C21				
37680-68-5	34-TrCB	U	ND	pg/L	5.86	20.0
37680-69-6	35-TrCB	U	ND	pg/L	6.32	40.0
38444-87-0	36-TrCB	U	ND	pg/L	5.90	20.0
38444-90-5	37-TrCB	U	ND	pg/L	6.38	20.0
53555-66-1	38-TrCB	U	ND	pg/L	6.14	20.0
38444-88-1	39-TrCB	U	ND	pg/L	6.00	20.0
38444-93-8	40-TeCB	CU	ND	pg/L	5.78	40.0
52663-59-9	41-TeCB	U	ND	pg/L	8.48	20.0
36559-22-5	42-TeCB	U	ND	pg/L	6.26	20.0
70362-46-8	43-TeCB	U	ND	pg/L	7.40	20.0
41464-39-5	44-TeCB	CU	ND	pg/L	6.06	60.0
70362-45-7	45-TeCB	CU	ND	pg/L	4.78	40.0
41464-47-5	46-TeCB	U	ND	pg/L	4.80	20.0
2437-79-8	47-TeCB	C44				
70362-47-9	48-TeCB	U	ND	pg/L	6.50	20.0
41464-40-8	49-TeCB	CU	ND	pg/L	5.66	40.0
62796-65-0	50-TeCB	CU	ND	pg/L	4.40	40.0
68194-04-7	51-TeCB	C45				
35693-99-3	52-TeCB	U	ND	pg/L	6.58	20.0
41464-41-9	53-TeCB	C50				
15968-05-5	54-TeCB	U	ND	pg/L	3.32	20.0
74338-24-2	55-TeCB	U	ND	pg/L	4.76	20.0
41464-43-1	56-TeCB	U	ND	pg/L	5.00	20.0
70424-67-8	57-TeCB	U	ND	pg/L	4.86	20.0
41464-49-7	58-TeCB	U	ND	pg/L	5.06	20.0
74472-33-6	59-TeCB	CU	ND	pg/L	4.92	60.0
33025-41-1	60-TeCB	U	ND	pg/L	4.72	20.0
33284-53-6	61-TeCB	CU	ND	pg/L	4.72	80.0
54230-22-7	62-TeCB	C59				
74472-34-7	63-TeCB	U	ND	pg/L	4.50	20.0
52663-58-8	64-TeCB	U	ND	pg/L	4.92	20.0

Comments:

C **Congener has coeluters. When Cxxx, refer to congener number xxx for data**
J **Value is estimated**
U **Analyte was analyzed for, but not detected above the specified detection limit.**

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number: 1707E46 **Client:** HALL001 **Project:** HALL00113
Lab Sample ID: 12019228 **Matrix:** WATER
Client Sample: QC for batch 35297
Client ID: MB for batch 35297 **Prep Basis:** As Received
Batch ID: 35299 **Method:** EPA Method 1668A
Run Date: 08/12/2017 17:15 **Analyst:** MLS **Instrument:** HRP791
Data File: c12aug17a-4 **Dilution:** 1
Prep Batch: 35297 **Prep Method:** SW846 3520C **Prep SOP Ref:** CF-OA-E-001
Prep Date: 08-AUG-17 **Prep Aliquot:** 1000 mL

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
33284-54-7	65-TeCB	C44				
32598-10-0	66-TeCB	U	ND	pg/L	4.48	20.0
73575-53-8	67-TeCB	U	ND	pg/L	4.38	20.0
73575-52-7	68-TeCB	U	ND	pg/L	4.56	20.0
60233-24-1	69-TeCB	C49				
32598-11-1	70-TeCB	C61				
41464-46-4	71-TeCB	C40				
41464-42-0	72-TeCB	U	ND	pg/L	4.62	20.0
74338-23-1	73-TeCB	U	ND	pg/L	5.40	20.0
32690-93-0	74-TeCB	C61				
32598-12-2	75-TeCB	C59				
70362-48-0	76-TeCB	C61				
32598-13-3	77-TeCB	U	ND	pg/L	4.40	20.0
70362-49-1	78-TeCB	U	ND	pg/L	4.20	20.0
41464-48-6	79-TeCB	U	ND	pg/L	3.86	20.0
33284-52-5	80-TeCB	U	ND	pg/L	4.14	20.0
70362-50-4	81-TeCB	U	ND	pg/L	4.16	20.0
52663-62-4	82-PeCB	U	ND	pg/L	4.12	20.0
60145-20-2	83-PeCB	U	ND	pg/L	4.74	20.0
52663-60-2	84-PeCB	U	ND	pg/L	4.66	20.0
65510-45-4	85-PeCB	CU	ND	pg/L	3.30	60.0
55312-69-1	86-PeCB	CU	ND	pg/L	3.46	120
38380-02-8	87-PeCB	C86				
55215-17-3	88-PeCB	CU	ND	pg/L	4.40	40.0
73575-57-2	89-PeCB	U	ND	pg/L	4.42	20.0
68194-07-0	90-PeCB	CJ	4.18	pg/L	3.62	60.0
68194-05-8	91-PeCB	C88				
52663-61-3	92-PeCB	U	ND	pg/L	4.10	20.0
73575-56-1	93-PeCB	CU	ND	pg/L	4.42	40.0
73575-55-0	94-PeCB	U	ND	pg/L	4.76	20.0
38379-99-6	95-PeCB	U	ND	pg/L	4.28	20.0
73575-54-9	96-PeCB	U	ND	pg/L	2.80	20.0

Comments:
C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
41464-51-1	97-PeCB	C86				
60233-25-2	98-PeCB	CU	ND	pg/L	4.50	40.0
38380-01-7	99-PeCB	U	ND	pg/L	3.80	20.0
39485-83-1	100-PeCB	C93				
37680-73-2	101-PeCB	C90				
68194-06-9	102-PeCB	C98				
60145-21-3	103-PeCB	U	ND	pg/L	4.06	20.0
56558-16-8	104-PeCB	U	ND	pg/L	2.70	20.0
32598-14-4	105-PeCB	U	ND	pg/L	3.52	20.0
70424-69-0	106-PeCB	U	ND	pg/L	3.20	20.0
70424-68-9	107-PeCB	U	ND	pg/L	3.20	20.0
70362-41-3	108-PeCB	CU	ND	pg/L	3.48	40.0
74472-35-8	109-PeCB	C86				
38380-03-9	110-PeCB	CU	ND	pg/L	3.02	40.0
39635-32-0	111-PeCB	U	ND	pg/L	2.88	20.0
74472-36-9	112-PeCB	U	ND	pg/L	2.94	20.0
68194-10-5	113-PeCB	C90				
74472-37-0	114-PeCB	U	ND	pg/L	3.66	20.0
74472-38-1	115-PeCB	C110				
18259-05-7	116-PeCB	C85				
68194-11-6	117-PeCB	C85				
31508-00-6	118-PeCB	U	ND	pg/L	3.46	20.0
56558-17-9	119-PeCB	C86				
68194-12-7	120-PeCB	U	ND	pg/L	2.66	20.0
56558-18-0	121-PeCB	U	ND	pg/L	3.24	20.0
76842-07-4	122-PeCB	U	ND	pg/L	3.50	20.0
65510-44-3	123-PeCB	U	ND	pg/L	3.60	20.0
70424-70-3	124-PeCB	C108				
74472-39-2	125-PeCB	C86				
57465-28-8	126-PeCB	U	ND	pg/L	3.26	20.0
39635-33-1	127-PeCB	U	ND	pg/L	2.96	20.0
38380-07-3	128-HxCB	CU	ND	pg/L	4.74	40.0

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
55215-18-4	129-HxCB	CJ	8.36	pg/L	5.34	60.0
52663-66-8	130-HxCB	U	ND	pg/L	6.20	20.0
61798-70-7	131-HxCB	U	ND	pg/L	7.22	20.0
38380-05-1	132-HxCB	U	ND	pg/L	6.96	20.0
35694-04-3	133-HxCB	U	ND	pg/L	6.26	20.0
52704-70-8	134-HxCB	U	ND	pg/L	8.22	20.0
52744-13-5	135-HxCB	CU	ND	pg/L	3.96	40.0
38411-22-2	136-HxCB	U	ND	pg/L	3.14	20.0
35694-06-5	137-HxCB	U	ND	pg/L	6.12	20.0
35065-28-2	138-HxCB	C129				
56030-56-9	139-HxCB	CU	ND	pg/L	6.14	40.0
59291-64-4	140-HxCB	C139				
52712-04-6	141-HxCB	U	ND	pg/L	5.54	20.0
41411-61-4	142-HxCB	U	ND	pg/L	6.60	20.0
68194-15-0	143-HxCB	U	ND	pg/L	6.22	20.0
68194-14-9	144-HxCB	U	ND	pg/L	3.72	20.0
74472-40-5	145-HxCB	U	ND	pg/L	3.36	20.0
51908-16-8	146-HxCB	U	ND	pg/L	5.38	20.0
68194-13-8	147-HxCB	CU	ND	pg/L	6.30	40.0
74472-41-6	148-HxCB	U	ND	pg/L	4.04	20.0
38380-04-0	149-HxCB	C147				
68194-08-1	150-HxCB	U	ND	pg/L	3.24	40.0
52663-63-5	151-HxCB	C135				
68194-09-2	152-HxCB	U	ND	pg/L	3.20	20.0
35065-27-1	153-HxCB	CJ	8.08	pg/L	4.82	40.0
60145-22-4	154-HxCB	U	ND	pg/L	3.40	20.0
33979-03-2	155-HxCB	U	ND	pg/L	3.06	20.0
38380-08-4	156-HxCB	CU	ND	pg/L	4.76	40.0
69782-90-7	157-HxCB	C156				
74472-42-7	158-HxCB	U	ND	pg/L	3.94	20.0
39635-35-3	159-HxCB	U	ND	pg/L	3.64	20.0
41411-62-5	160-HxCB	U	ND	pg/L	4.52	20.0

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
74472-43-8	161-HxCB	U	ND	pg/L	4.52	20.0
39635-34-2	162-HxCB	U	ND	pg/L	3.72	20.0
74472-44-9	163-HxCB	C129				
74472-45-0	164-HxCB	U	ND	pg/L	4.24	20.0
74472-46-1	165-HxCB	U	ND	pg/L	5.16	20.0
41411-63-6	166-HxCB	C128				
52663-72-6	167-HxCB	U	ND	pg/L	3.68	20.0
59291-65-5	168-HxCB	C153				
32774-16-6	169-HxCB	U	ND	pg/L	3.24	20.0
35065-30-6	170-HpCB	U	ND	pg/L	4.62	40.0
52663-71-5	171-HpCB	CU	ND	pg/L	5.10	40.0
52663-74-8	172-HpCB	U	ND	pg/L	4.86	20.0
68194-16-1	173-HpCB	C171				
38411-25-5	174-HpCB	U	ND	pg/L	5.16	20.0
40186-70-7	175-HpCB	U	ND	pg/L	3.60	20.0
52663-65-7	176-HpCB	U	ND	pg/L	3.12	20.0
52663-70-4	177-HpCB	U	ND	pg/L	5.30	20.0
52663-67-9	178-HpCB	U	ND	pg/L	3.84	20.0
52663-64-6	179-HpCB	U	ND	pg/L	3.14	20.0
35065-29-3	180-HpCB	CJ	12.8	pg/L	4.06	40.0
74472-47-2	181-HpCB	U	ND	pg/L	5.12	20.0
60145-23-5	182-HpCB	U	ND	pg/L	3.58	40.0
52663-69-1	183-HpCB	CU	ND	pg/L	4.94	40.0
74472-48-3	184-HpCB	U	ND	pg/L	3.12	20.0
52712-05-7	185-HpCB	C183				
74472-49-4	186-HpCB	U	ND	pg/L	3.30	20.0
52663-68-0	187-HpCB	U	ND	pg/L	3.58	20.0
74487-85-7	188-HpCB	U	ND	pg/L	3.30	20.0
39635-31-9	189-HpCB	U	ND	pg/L	3.88	20.0
41411-64-7	190-HpCB	U	ND	pg/L	3.58	20.0
74472-50-7	191-HpCB	U	ND	pg/L	3.60	20.0
74472-51-8	192-HpCB	U	ND	pg/L	4.02	20.0

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
69782-91-8	193-HpCB	C180				
35694-08-7	194-OcCB	J	6.54	pg/L	3.64	40.0
52663-78-2	195-OcCB	U	ND	pg/L	4.04	20.0
42740-50-1	196-OcCB	U	ND	pg/L	4.08	20.0
33091-17-7	197-OcCB	CU	ND	pg/L	3.50	40.0
68194-17-2	198-OcCB	CJ	7.18	pg/L	4.28	40.0
52663-75-9	199-OcCB	C198				
52663-73-7	200-OcCB	C197				
40186-71-8	201-OcCB	U	ND	pg/L	3.52	20.0
2136-99-4	202-OcCB	U	ND	pg/L	4.22	20.0
52663-76-0	203-OcCB	J	5.54	pg/L	3.98	40.0
74472-52-9	204-OcCB	U	ND	pg/L	3.52	20.0
74472-53-0	205-OcCB	U	ND	pg/L	2.94	20.0
40186-72-9	206-NoCB	U	ND	pg/L	3.20	20.0
52663-79-3	207-NoCB	J	4.72	pg/L	2.92	20.0
52663-77-1	208-NoCB	U	ND	pg/L	2.98	20.0
2051-24-3	209-DeCB	J	4.82	pg/L	2.64	20.0
1336-36-3	Total PCB Congeners	J	62.2	pg/L	6.68	20.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		1120	2000	pg/L	56.2	(15%-150%)
13C-3-MoCB		1230	2000	pg/L	61.6	(15%-150%)
13C-4-DiCB		1250	2000	pg/L	62.6	(25%-150%)
13C-15-DiCB		1690	2000	pg/L	84.6	(25%-150%)
13C-19-TrCB		1480	2000	pg/L	73.9	(25%-150%)
13C-37-TrCB		1910	2000	pg/L	95.7	(25%-150%)
13C-54-TeCB		1680	2000	pg/L	84.1	(25%-150%)
13C-77-TeCB		2600	2000	pg/L	130	(25%-150%)
13C-81-TeCB		2570	2000	pg/L	129	(25%-150%)
13C-104-PeCB		1610	2000	pg/L	80.5	(25%-150%)
13C-105-PeCB		2200	2000	pg/L	110	(25%-150%)
13C-114-PeCB		2140	2000	pg/L	107	(25%-150%)
13C-118-PeCB		2130	2000	pg/L	107	(25%-150%)
13C-123-PeCB		2170	2000	pg/L	108	(25%-150%)
13C-126-PeCB		2800	2000	pg/L	140	(25%-150%)
13C-155-HxCB		1170	2000	pg/L	58.5	(25%-150%)
13C-156-HxCB	C	3990	4000	pg/L	99.7	(25%-150%)
13C-157-HxCB	C156L					
13C-167-HxCB		1920	2000	pg/L	96.2	(25%-150%)
13C-169-HxCB		2420	2000	pg/L	121	(25%-150%)
13C-188-HpCB		936	2000	pg/L	46.8	(25%-150%)
13C-189-HpCB		1470	2000	pg/L	73.6	(25%-150%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019228**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**MB for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 17:15**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-4**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		1170	2000	pg/L	58.3	(25%-150%)
13C-205-OcCB		1860	2000	pg/L	93.2	(25%-150%)
13C-206-NoCB		2170	2000	pg/L	109	(25%-150%)
13C-208-NoCB		1620	2000	pg/L	81.2	(25%-150%)
13C-209-DeCB		2260	2000	pg/L	113	(25%-150%)
13C-28-TrCB		1540	2000	pg/L	76.8	(30%-135%)
13C-111-PeCB		1940	2000	pg/L	96.9	(30%-135%)
13C-178-HpCB		1930	2000	pg/L	96.3	(30%-135%)

Comments:

C **Congener has coeluters. When Cxxx, refer to congener number xxx for data**

J **Value is estimated**

U **Analyte was analyzed for, but not detected above the specified detection limit.**

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019229**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**LCS for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 14:59**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-2**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB		469	pg/L	16.2	40.0
2051-62-9	3-MoCB		521	pg/L	13.1	20.0
13029-08-8	4-DiCB		444	pg/L	40.6	40.0
2050-68-2	15-DiCB		584	pg/L	26.5	20.0
38444-73-4	19-TrCB		475	pg/L	16.1	40.0
38444-90-5	37-TrCB		461	pg/L	15.2	20.0
15968-05-5	54-TeCB		853	pg/L	6.04	20.0
32598-13-3	77-TeCB		923	pg/L	17.4	20.0
70362-50-4	81-TeCB		1000	pg/L	17.1	20.0
56558-16-8	104-PeCB		863	pg/L	6.54	20.0
32598-14-4	105-PeCB		1090	pg/L	17.6	20.0
74472-37-0	114-PeCB		1050	pg/L	17.5	20.0
31508-00-6	118-PeCB		1020	pg/L	17.3	20.0
65510-44-3	123-PeCB		987	pg/L	17.6	20.0
57465-28-8	126-PeCB		1080	pg/L	16.5	20.0
33979-03-2	155-HxCB		941	pg/L	4.70	20.0
38380-08-4	156-HxCB	C	2250	pg/L	13.3	40.0
69782-90-7	157-HxCB	C156				
52663-72-6	167-HxCB		1150	pg/L	10.3	20.0
32774-16-6	169-HxCB		1050	pg/L	9.20	20.0
74487-85-7	188-HpCB		927	pg/L	5.48	20.0
39635-31-9	189-HpCB		1090	pg/L	5.48	20.0
2136-99-4	202-OcCB		1460	pg/L	4.96	20.0
74472-53-0	205-OcCB		1430	pg/L	4.02	20.0
40186-72-9	206-NoCB		1330	pg/L	4.02	20.0
52663-77-1	208-NoCB		1460	pg/L	3.52	20.0
2051-24-3	209-DeCB		1450	pg/L	2.90	20.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		890	2000	pg/L	44.5	(15%-140%)
13C-3-MoCB		1030	2000	pg/L	51.5	(15%-140%)
13C-4-DiCB		1050	2000	pg/L	52.6	(30%-140%)
13C-15-DiCB		1380	2000	pg/L	69.2	(30%-140%)
13C-19-TrCB		1250	2000	pg/L	62.6	(30%-140%)
13C-37-TrCB		1550	2000	pg/L	77.7	(30%-140%)
13C-54-TeCB		1500	2000	pg/L	75.1	(30%-140%)
13C-77-TeCB		2210	2000	pg/L	110	(30%-140%)
13C-81-TeCB		2120	2000	pg/L	106	(30%-140%)
13C-104-PeCB		1370	2000	pg/L	68.5	(30%-140%)
13C-105-PeCB		1800	2000	pg/L	89.9	(30%-140%)
13C-114-PeCB		1780	2000	pg/L	88.8	(30%-140%)
13C-118-PeCB		1770	2000	pg/L	88.3	(30%-140%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019229**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**LCS for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 14:59**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-2**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-123-PeCB		1780	2000	pg/L	89.1	(30%-140%)
13C-126-PeCB		2310	2000	pg/L	115	(30%-140%)
13C-155-HxCB		993	2000	pg/L	49.6	(30%-140%)
13C-156-HxCB	C	3370	4000	pg/L	84.3	(30%-140%)
13C-157-HxCB	C156L					
13C-167-HxCB		1610	2000	pg/L	80.4	(30%-140%)
13C-169-HxCB		2060	2000	pg/L	103	(30%-140%)
13C-188-HpCB		812	2000	pg/L	40.6	(30%-140%)
13C-189-HpCB		1280	2000	pg/L	64.2	(30%-140%)
13C-202-OcCB		1000	2000	pg/L	50.0	(30%-140%)
13C-205-OcCB		1580	2000	pg/L	79.1	(30%-140%)
13C-206-NoCB		1850	2000	pg/L	92.4	(30%-140%)
13C-208-NoCB		1410	2000	pg/L	70.3	(30%-140%)
13C-209-DeCB		1920	2000	pg/L	96.1	(30%-140%)
13C-28-TrCB		1330	2000	pg/L	66.6	(40%-125%)
13C-111-PeCB		1620	2000	pg/L	81.2	(40%-125%)
13C-178-HpCB		1610	2000	pg/L	80.7	(40%-125%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019230**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**LCSD for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 16:07**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-3**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB		452	pg/L	17.5	40.0
2051-62-9	3-MoCB		528	pg/L	14.4	20.0
13029-08-8	4-DiCB		464	pg/L	38.9	40.0
2050-68-2	15-DiCB		673	pg/L	29.6	20.0
38444-73-4	19-TrCB		485	pg/L	14.8	40.0
38444-90-5	37-TrCB		468	pg/L	18.1	20.0
15968-05-5	54-TeCB		901	pg/L	8.04	20.0
32598-13-3	77-TeCB		948	pg/L	22.3	20.0
70362-50-4	81-TeCB		1010	pg/L	23.0	20.0
56558-16-8	104-PeCB		943	pg/L	9.18	20.0
32598-14-4	105-PeCB		1100	pg/L	20.1	20.0
74472-37-0	114-PeCB		1070	pg/L	20.1	20.0
31508-00-6	118-PeCB		1030	pg/L	20.6	20.0
65510-44-3	123-PeCB		985	pg/L	19.9	20.0
57465-28-8	126-PeCB		1110	pg/L	18.8	20.0
33979-03-2	155-HxCB		935	pg/L	6.88	20.0
38380-08-4	156-HxCB	C	2260	pg/L	19.7	40.0
69782-90-7	157-HxCB	C156				
52663-72-6	167-HxCB		1130	pg/L	15.4	20.0
32774-16-6	169-HxCB		1060	pg/L	12.8	20.0
74487-85-7	188-HpCB		913	pg/L	378	20.0
39635-31-9	189-HpCB		1090	pg/L	6.14	20.0
2136-99-4	202-OcCB		1460	pg/L	6.86	20.0
74472-53-0	205-OcCB		1430	pg/L	5.26	20.0
40186-72-9	206-NoCB		1330	pg/L	4.00	20.0
52663-77-1	208-NoCB		1470	pg/L	3.74	20.0
2051-24-3	209-DeCB		1440	pg/L	2.70	20.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		1030	2000	pg/L	51.4	(15%-140%)
13C-3-MoCB		1190	2000	pg/L	59.6	(15%-140%)
13C-4-DiCB		1190	2000	pg/L	59.3	(30%-140%)
13C-15-DiCB		1520	2000	pg/L	75.9	(30%-140%)
13C-19-TrCB		1470	2000	pg/L	73.5	(30%-140%)
13C-37-TrCB		1590	2000	pg/L	79.5	(30%-140%)
13C-54-TeCB		1700	2000	pg/L	84.8	(30%-140%)
13C-77-TeCB		2260	2000	pg/L	113	(30%-140%)
13C-81-TeCB		2230	2000	pg/L	111	(30%-140%)
13C-104-PeCB		1630	2000	pg/L	81.5	(30%-140%)
13C-105-PeCB		2170	2000	pg/L	108	(30%-140%)
13C-114-PeCB		2130	2000	pg/L	107	(30%-140%)
13C-118-PeCB		2070	2000	pg/L	104	(30%-140%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1707E46**	**Client:**	**HALL001**	**Project:**	**HALL00113**
Lab Sample ID:	**12019230**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35297**				
Client ID:	**LCSD for batch 35297**			**Prep Basis:**	**As Received**
Batch ID:	**35299**	**Method:**	**EPA Method 1668A**		
Run Date:	**08/12/2017 16:07**	**Analyst:**	**MLS**	**Instrument:**	**HRP791**
Data File:	**c12aug17a-3**			**Dilution:**	**1**
Prep Batch:	**35297**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**08-AUG-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%		Acceptable Limits
13C-123-PeCB		2110	2000	pg/L	106		(30%-140%)
13C-126-PeCB		2830	2000	pg/L	141	*	(30%-140%)
13C-155-HxCB		1140	2000	pg/L	57.1		(30%-140%)
13C-156-HxCB	C	4270	4000	pg/L	107		(30%-140%)
13C-157-HxCB	C156L						
13C-167-HxCB		2000	2000	pg/L	100		(30%-140%)
13C-169-HxCB		2680	2000	pg/L	134		(30%-140%)
13C-188-HpCB		824	2000	pg/L	41.2		(30%-140%)
13C-189-HpCB		1470	2000	pg/L	73.7		(30%-140%)
13C-202-OcCB		1050	2000	pg/L	52.7		(30%-140%)
13C-205-OcCB		1860	2000	pg/L	93.1		(30%-140%)
13C-206-NoCB		2200	2000	pg/L	110		(30%-140%)
13C-208-NoCB		1600	2000	pg/L	79.9		(30%-140%)
13C-209-DeCB		2330	2000	pg/L	116		(30%-140%)
13C-28-TrCB		1490	2000	pg/L	74.7		(40%-125%)
13C-111-PeCB		1860	2000	pg/L	93.2		(40%-125%)
13C-178-HpCB		1900	2000	pg/L	95.2		(40%-125%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 02, 2017

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

Sept. 27, 2017 Rio Grande North - E. coli result

RE: CMC OrderNo.: 1709F09

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1709F09**
Date Reported: **10/2/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1709F09-001
Matrix: AQUEOUS

Client Sample ID: Rio Grande-North-20170927
Collection Date: 9/27/2017 12:00:00 PM
Received Date: 9/27/2017 12:30:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SM 9223B FECAL INDICATOR: E. COLI MPN						Analyst: **SMS**
E. Coli	733	10.00		MPN/100mL	10	9/28/2017 6:51:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: 1709F09   RcptNo: 1

Received By: Anne Thorne 9/27/2017 12:30:00 PM Anne Thorne

Completed By: Anne Thorne 9/27/2017 12:45:42 PM Anne Thorne

Reviewed By: AT 09/27/17

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Samples were collected the same day and chilled.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ______
(<2 or >12 unless noted)
Adjusted? ______
Checked by: ______

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:	Date
By Whom:	Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	
Client Instructions:	

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	17.9	Good	Not Present			

Chain-of-Custody Record

Client: AMAFCA

Mailing Address: 2600 Prospect AQ

Phone #: 505-884-2215

email or Fax#: pchavez@amafca.org

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:
☒ Standard ☐ Rush ______

Project Name: CMC

Project #:

Project Manager: Patrick Chavez

Sampler:
On Ice: ☒ Yes ☐ No
Sample Temperature: 17.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1709F09	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	E. coli - Enumerated				Air Bubbles (Y or N)
9-27-17	1200	AQ	RioGrande_North_20170927	1		-001												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/27/17	1230	[signature]	[signature]	09/27/17	1230
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL
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Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 02, 2017

Sept. 27, 2017 Rio Grande at Alameda Pre-storm - E. coli result

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

RE: ALAMEDA CMC

OrderNo.: 1709F01

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: ALAMEDA CMC
Lab ID: 1709F01-001 **Matrix:** AQUEOUS

Client Sample ID: ALAMEDA PRE STORM
Collection Date: 9/27/2017 10:30:00 AM
Received Date: 9/27/2017 10:54:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM 9223B FECAL INDICATOR: E. COLI MPN							Analyst: **SMS**
E. Coli	218	10.00		MPN/100mL	10	9/28/2017 2:48:00 PM	34107

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL
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Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: 1709F01   RcptNo: 1

Received By: **Sophia Campuzano** 9/27/2017 10:54:00 AM Sophia Campuzano

Completed By: **Sophia Campuzano** 9/27/2017 11:08:14 AM Sophia Campuzano

Reviewed By: ENM 9/27/17

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Samples were collected the same day and chilled.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ______
(<2 or >12 unless noted)
Adjusted? ______
Checked by: ______

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	13.3	Good	Not Present			

Chain-of-Custody Record

Client: AMAFCA - CMC

Mailing Address: 2600 Prospect Ave NE
Albuquerque, NM 87107

Phone #: 505 884-2215

email or Fax#: pchavez@amafca.org

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:
☒ Standard ☐ Rush ______

Project Name: Alameda CMC

Project #:

Project Manager: Patrick Chavez

Sampler:
On Ice: ☒ Yes ☐ No
Sample Temperature: 13.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1709F01	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Enumeration				Air Bubbles (Y or N)
9/27/17	10:30A	AQ	Alameda Pre Storm			-001												✓				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/27/17	10:54	[signature]	[signature]	09/27/17	1054
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Client [initials] 09/27/17

Bernalillo WWTP
E. coli WORKSHEET

Time of Sampling: 10:00PM Time of Arrival: 10:23PM
Type of Sample: Grab Sample Instantaneous Flow: ______ MGD
Exact Location: EFF WW River flow
Method Used: Hach m-ColiBlue 24 EPA Approved Method

Refrigerator Temperature: 4 °C
(Samples must be stored at <6°C)

In Incubator:
Date: 9/27/17 Time: 10:41 (24 Hours ± 2 hours.) Temp: 35.1 °C (35.0 ± 0.5°C)

Out of Incubator:
Date: 9/28/17 Time: ~~10:41~~ mw 8:52 (24 Hours ± 2 hours.) Temp: 35.1 °C (35.0 ± 0.5°C)

Formula: Calculate coliform density: Use all plates and filtered volumes that fall between the ideal range. Include duplicates and multiple dilutions.

$$\text{Colonies/100 mL} = \frac{\text{(coliform colonies counted)} \times (100)}{\text{mLs Sample filtered}}$$

Formula: If no plate falls in the ideal range, use all plates and filtered volumes not categorized as TNTC or Confluent Growth.

$$\text{Colonies/100 mL} = \frac{\text{(Sum of colonies in all samples)} \times (100)}{\text{Sum of volume (in mL) of all samples}}$$

(Use the worksheet below to calculate coliform density)

IF: The total number of colonies exceeds 200 per membrane, or the colonies are too indistinct for accurate counting, or exceed 60 blue colonies, report the results as "Too Numerous to Count (TNTC)" Or "confluent growth" as applies.

**Use plates that fall in the ideal range for Quantitative Determinations for e-coli (20-60)

E. coli Colonies Reported/100 mls
TNTC

Sample	Volume	Blue Colonies
Blank I	100 mL	Ø
25	10mL ~~25 mL~~	T
50A	20mL ~~50 mL~~	N
50B	20mL ~~50 mL~~	T
100	50mL ~~100 mL~~	C
Blank II	100 mL	Ø

Sampled By: Mark Wooton

Analyzed By: Mark Wooton

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 31, 2017

Sept. 27, 2017 Rio Grande North and Sept. 28, 2017 Rio Grande South results

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

RE: CMC   OrderNo.: 1709F81

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 5 sample(s) on 9/28/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Field Data - Provided by DBS&A (field notebook):
9/27/17 - Rio Grande North
DO = 7.13 mg/L, pH = 7.83, Conductivity = 103.4 umhos/cm, and Temperature = 16.3°C
9/28/17 - Rio Grande South
DO = 7.23 mg/L, pH = 7.92, Conductivity = 192.2 umhos/cm, and Temperature = 15.2°C

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1709F81-001
Matrix: AQUEOUS

Client Sample ID: Rio Grande-South-20170928
Collection Date: 9/28/2017 9:00:00 AM
Received Date: 9/28/2017 1:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Nitrogen, Nitrite (As N)	ND	0.034	0.50		mg/L	5	9/29/2017 10:01:11 AM	R46023
Nitrogen, Nitrate (As N)	0.46	0.11	0.50	J	mg/L	5	9/29/2017 10:01:11 AM	R46023
EPA METHOD 200.7: METALS							Analyst: **pmf**	
Calcium	80	0.078	1.0		mg/L	1	10/16/2017 6:38:36 PM	34381
Magnesium	15	0.25	1.0		mg/L	1	10/16/2017 6:38:36 PM	34381
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Copper	0.00098	0.00030	0.0010	J	mg/L	1	10/6/2017 8:08:32 PM	C46196
Lead	0.00047	0.00017	0.00050	J	mg/L	1	10/6/2017 8:08:32 PM	C46196
SM2340B: HARDNESS							Analyst: **pmf**	
Hardness (As CaCO3)	260	2.5	6.6		mg/L	1	10/17/2017	R46397
SM5210B: BOD							Analyst: **SMS**	
Biochemical Oxygen Demand	5.0	2.0	2.0		mg/L	1	10/4/2017 12:17:00 PM	34138
SM 9223B FECAL INDICATOR: E. COLI MPN							Analyst: **SMS**	
E. Coli	6131	10.00	10.00		MPN/100	10	9/29/2017 3:20:00 PM	34130
EPA METHOD 1664B							Analyst: **dbf**	
N-Hexane Extractable Material	ND	3.85	10.2		mg/L	1	10/4/2017 8:00:00 AM	34213
SM 4500 NH3: AMMONIA							Analyst: **smb**	
Nitrogen, Ammonia	ND	0.40	1.0		mg/L	1	10/16/2017 2:44:00 PM	R46385
SM4500-H+B: PH							Analyst: **JRR**	
pH	7.97			H	pH units	1	10/2/2017 11:40:44 AM	R46061
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **JRR**	
Phosphorus, Total (As P)	0.74	0.050	0.050	D	mg/L	1	10/13/2017 9:28:00 AM	34388
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: **KS**	
Total Dissolved Solids	260	118	200	D	mg/L	1	10/4/2017 8:51:00 PM	34208
SM 4500 NORG C: TKN							Analyst: **smb**	
Nitrogen, Kjeldahl, Total	1.7	0.88	2.0	JD	mg/L	1	10/17/2017 10:53:00 AM	34412
SM 2540D: TSS							Analyst: **KS**	
Suspended Solids	810	20	20	D	mg/L	1	10/2/2017 4:41:00 PM	34153

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1709F81-003 **Matrix:** AQUEOUS

Client Sample ID: Rio Grande-North-20170927
Collection Date: 9/27/2017 12:00:00 PM
Received Date: 9/28/2017 1:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: **MRA**	
Nitrogen, Nitrite (As N)	ND	0.034	0.50		mg/L	5	9/29/2017 10:26:00 AM	R46023
Nitrogen, Nitrate (As N)	0.20	0.11	0.50	J	mg/L	5	9/29/2017 10:26:00 AM	R46023
EPA METHOD 200.7: METALS							Analyst: **pmf**	
Calcium	40	0.078	1.0		mg/L	1	10/16/2017 6:40:14 PM	34381
Magnesium	9.0	0.25	1.0		mg/L	1	10/16/2017 6:40:14 PM	34381
EPA 200.8: DISSOLVED METALS							Analyst: **JLF**	
Copper	0.00095	0.00030	0.0010	J	mg/L	1	10/6/2017 8:14:39 PM	C46196
Lead	ND	0.00017	0.00050		mg/L	1	10/6/2017 8:14:39 PM	C46196
SM2340B: HARDNESS							Analyst: **pmf**	
Hardness (As CaCO3)	140	2.5	6.6		mg/L	1	10/17/2017	R46397
SM5210B: BOD							Analyst: **SMS**	
Biochemical Oxygen Demand	2.0	2.0	2.0		mg/L	1	10/4/2017 12:17:00 PM	34138
EPA METHOD 1664B							Analyst: **dbf**	
N-Hexane Extractable Material	ND	3.73	9.86		mg/L	1	10/4/2017 8:00:00 AM	34213
SM 4500 NH3: AMMONIA							Analyst: **smb**	
Nitrogen, Ammonia	ND	0.40	1.0		mg/L	1	10/16/2017 2:44:00 PM	R46385
SM4500-H+B: PH							Analyst: **JRR**	
pH	8.06			H	pH units	1	10/2/2017 11:44:35 AM	R46061
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **JRR**	
Phosphorus, Total (As P)	0.28	0.050	0.050	D	mg/L	1	10/13/2017 9:29:00 AM	34388
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: **KS**	
Total Dissolved Solids	225	59.1	100	D	mg/L	1	10/4/2017 8:51:00 PM	34208
SM 4500 NORG C: TKN							Analyst: **smb**	
Nitrogen, Kjeldahl, Total	0.84	0.44	1.0	J	mg/L	1	10/17/2017 10:53:00 AM	34412
SM 2540D: TSS							Analyst: **KS**	
Suspended Solids	260	7.9	8.0	D	mg/L	1	10/2/2017 4:41:00 PM	34153

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1709F81-005 **Matrix:** AQUEOUS

Client Sample ID: Rio Grande-South-20170928 Filt
Collection Date: 9/28/2017 9:00:00 AM
Received Date: 9/28/2017 1:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **JRR**	
Phosphorus, Total (As P)	0.080	0.010	0.010		mg/L	1	10/13/2017 9:34:00 AM	34388

Dissolved phosphorous - filtered sample

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1709F81-006 **Matrix:** AQUEOUS

Client Sample ID: Rio Grande-North-20170927 Filt
Collection Date: 9/27/2017 12:00:00 PM
Received Date: 9/28/2017 1:40:00 PM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 365.1: TOTAL PHOSPHOROUS							Analyst: **JRR**	
Phosphorus, Total (As P)	0.029	0.010	0.010		mg/L	1	10/13/2017 9:35:00 AM	34388

Dissolved phosphorous - filtered sample

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-001	**Sampling Date**	9/28/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-001A / RIO GRANDE-SOUTH-20170928			**Sampling Time**	9:00 AM
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Tetrahydrofuran	ND	ug/L	0.5	10/4/2017	SAT	EPA 8260C	

Surrogate Data

Sample Number 171003037-001

Surrogate Standard	Method	Percent Recovery	Control Limits
1,2-Dichlorobenzene-d4	EPA 8260C	100.4	70-130
4-Bromofluorobenzene	EPA 8260C	96.8	70-130
Toluene-d8	EPA 8260C	98.8	70-130

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-004	**Sampling Date**	9/27/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-003A / RIO GRANDE-NORTH-20170927			**Sampling Time**	12:00 PM
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Tetrahydrofuran	ND	ug/L	0.5	10/4/2017	SAT	EPA 8260C	

Surrogate Data

Sample Number 171003037-004

Surrogate Standard	Method	Percent Recovery	Control Limits
1,2-Dichlorobenzene-d4	EPA 8260C	102.8	70-130
4-Bromofluorobenzene	EPA 8260C	96.0	70-130
Toluene-d8	EPA 8260C	98.8	70-130

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-007	**Sampling Date**	9/27/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-004A / TRIP BLANK			**Sampling Time**	
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Tetrahydrofuran	ND	ug/L	0.5	10/4/2017	SAT	EPA 8260C	

Surrogate Data

Sample Number 171003037-007

Surrogate Standard	Method	Percent Recovery	Control Limits
1,2-Dichlorobenzene-d4	EPA 8260C	97.6	70-130
4-Bromofluorobenzene	EPA 8260C	97.2	70-130
Toluene-d8	EPA 8260C	99.2	70-130

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Tetrahydrofuran	8.11	ug/L	10	81.1	70-130	10/4/2017	10/4/2017

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Tetrahydrofuran	ND	ug/L	0.5	10/4/2017	10/4/2017

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-002	**Sampling Date**	9/28/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-001B / RIO GRANDE-SOUTH-20170928			**Extraction Date**	10/3/2017
Matrix	Water	**Sampling Time**	9:00 AM		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
4,4-DDD	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
4,4-DDE	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
4,4-DDT	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Aldrin	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
alpha-BHC	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Aroclor 1016 (PCB-1016)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
Aroclor 1221 (PCB-1221)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
Aroclor 1232 (PCB-1232)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
Aroclor 1242 (PCB-1242)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
Aroclor 1248 (PCB-1248)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
Aroclor 1254 (PCB-1254)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
Aroclor 1260 (PCB-1260)	ND	ug/L	2	10/10/2017	MAH	EPA 608	
beta-BHC	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Chlordane	ND	ug/L	1	10/10/2017	MAH	EPA 608	
delta-BHC	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Dieldrin	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Endosulfan I	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Endosulfan II	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Endosulfan sulfate	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Endrin	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Endrin aldehyde	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Endrin ketone	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-002	**Sampling Date**	9/28/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-001B / RIO GRANDE-SOUTH-20170928			**Extraction Date**	10/3/2017
Matrix	Water	**Sampling Time**	9:00 AM		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
gamma-BHC (Lindane)	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Heptachlor	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Heptachlor epoxide	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Methoxychlor	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
Toxaphene	ND	ug/L	1	10/10/2017	MAH	EPA 608	

Surrogate Data

Sample Number 171003037-002

Surrogate Standard	Method	Percent Recovery	Control Limits
DCB	EPA 608	97.0	30-130

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1709F81
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-005	**Sampling Date**	9/27/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-003B / RIO GRANDE-NORTH-20170927			**Extraction Date**	10/3/2017
Matrix	Water	**Sampling Time**	12:00 PM		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
4,4-DDD	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
4,4-DDE	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
4,4-DDT	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Aldrin	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
alpha-BHC	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Aroclor 1016 (PCB-1016)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
Aroclor 1221 (PCB-1221)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
Aroclor 1232 (PCB-1232)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
Aroclor 1242 (PCB-1242)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
Aroclor 1248 (PCB-1248)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
Aroclor 1254 (PCB-1254)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
Aroclor 1260 (PCB-1260)	ND	ug/L	0.2	10/10/2017	MAH	EPA 608	
beta-BHC	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Chlordane	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	
delta-BHC	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Dieldrin	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Endosulfan I	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Endosulfan II	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Endosulfan sulfate	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Endrin	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Endrin aldehyde	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Endrin ketone	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
gamma-BHC (Lindane)	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-005	**Sampling Date**	9/27/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-003B / RIO GRANDE-NORTH-20170927			**Extraction Date**	10/3/2017
Matrix	Water	**Sampling Time**	12:00 PM		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Heptachlor	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Heptachlor epoxide	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Methoxychlor	ND	ug/L	0.01	10/10/2017	MAH	EPA 608	
Toxaphene	ND	ug/L	0.1	10/10/2017	MAH	EPA 608	

Surrogate Data

Sample Number 171003037-005

Surrogate Standard	Method	Percent Recovery	Control Limits
DCB	EPA 608	59.6	30-130

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C595; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Endosulfan I	0.527	ug/L	0.5	105.4	30-130	10/3/2017	10/9/2017
4,4-DDE	0.524	ug/L	0.5	104.8	30-130	10/3/2017	10/9/2017
4,4-DDT	0.579	ug/L	0.5	115.8	30-130	10/3/2017	10/9/2017
Aldrin	0.491	ug/L	0.5	98.2	30-130	10/3/2017	10/9/2017
alpha-BHC	0.515	ug/L	0.5	103.0	30-130	10/3/2017	10/9/2017
Aroclor 1016 (PCB-1016)	4.94	ug/L	5	98.8	50-130	10/3/2017	10/9/2017
Aroclor 1260 (PCB-1260)	5.32	ug/L	5	106.4	50-130	10/3/2017	10/9/2017
beta-BHC	0.498	ug/L	0.5	99.6	30-130	10/3/2017	10/9/2017
4,4-DDD	0.520	ug/L	0.5	104.0	30-130	10/3/2017	10/9/2017
Dieldrin	0.524	ug/L	0.5	104.8	30-130	10/3/2017	10/9/2017
Methoxychlor	0.569	ug/L	0.5	113.8	30-130	10/3/2017	10/9/2017
Endosulfan II	0.534	ug/L	0.5	106.8	30-130	10/3/2017	10/9/2017
Endosulfan sulfate	0.527	ug/L	0.5	105.4	30-130	10/3/2017	10/9/2017
Endrin	0.535	ug/L	0.5	107.0	30-130	10/3/2017	10/9/2017
Endrin aldehyde	0.497	ug/L	0.5	99.4	30-130	10/3/2017	10/9/2017
Endrin ketone	0.552	ug/L	0.5	110.4	30-130	10/3/2017	10/9/2017
gamma-BHC (Lindane)	0.523	ug/L	0.5	104.6	30-130	10/3/2017	10/9/2017
Heptachlor	0.489	ug/L	0.5	97.8	30-130	10/3/2017	10/9/2017
Heptachlor epoxide	0.510	ug/L	0.5	102.0	30-130	10/3/2017	10/9/2017
delta-BHC	0.506	ug/L	0.5	101.2	30-130	10/3/2017	10/9/2017

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
170929007-002	Endosulfan II	ND	0.461	ug/L	0.5	92.2	30-150	10/3/2017	10/9/2017
170929007-002	4,4-DDE	ND	0.395	ug/L	0.5	79.0	30-150	10/3/2017	10/9/2017
170929007-002	4,4-DDT	ND	0.434	ug/L	0.5	86.8	30-150	10/3/2017	10/9/2017
170929007-002	Aldrin	ND	0.409	ug/L	0.5	81.8	30-150	10/3/2017	10/9/2017
170929007-002	alpha-BHC	ND	0.468	ug/L	0.5	93.6	30-150	10/3/2017	10/9/2017
170929007-002	beta-BHC	ND	0.468	ug/L	0.5	93.6	30-150	10/3/2017	10/9/2017
170929007-002	delta-BHC	ND	0.464	ug/L	0.5	92.8	30-150	10/3/2017	10/9/2017
170929007-002	4,4-DDD	ND	0.431	ug/L	0.5	86.2	30-150	10/3/2017	10/9/2017
170929007-002	Endosulfan I	ND	0.461	ug/L	0.5	92.2	30-150	10/3/2017	10/9/2017
170929007-002	Methoxychlor	ND	0.479	ug/L	0.5	95.8	30-150	10/3/2017	10/9/2017
170929007-002	Endosulfan sulfate	ND	0.455	ug/L	0.5	91.0	30-150	10/3/2017	10/9/2017

Comments:

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 171003037
Project Name: 1709F81

Analytical Results Report

Quality Control Data

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
170929007-002	Endrin	ND	0.464	ug/L	0.5	92.8	30-150	10/3/2017	10/9/2017
170929007-002	Endrin aldehyde	ND	0.435	ug/L	0.5	87.0	30-150	10/3/2017	10/9/2017
170929007-002	Endrin ketone	ND	0.475	ug/L	0.5	95.0	30-150	10/3/2017	10/9/2017
170929007-002	gamma-BHC (Lindane)	ND	0.478	ug/L	0.5	95.6	30-150	10/3/2017	10/9/2017
170929007-002	Heptachlor	ND	0.434	ug/L	0.5	86.8	30-150	10/3/2017	10/9/2017
170929007-002	Heptachlor epoxide	ND	0.454	ug/L	0.5	90.8	30-150	10/3/2017	10/9/2017
170929007-002	Dieldrin	ND	0.455	ug/L	0.5	91.0	30-150	10/3/2017	10/9/2017

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Endosulfan II	0.471	ug/L	0.5	94.2	2.1	0-30	10/3/2017	10/9/2017
4,4-DDE	0.404	ug/L	0.5	80.8	2.3	0-30	10/3/2017	10/9/2017
4,4-DDT	0.441	ug/L	0.5	88.2	1.6	0-30	10/3/2017	10/9/2017
Aldrin	0.416	ug/L	0.5	83.2	1.7	0-30	10/3/2017	10/9/2017
alpha-BHC	0.470	ug/L	0.5	94.0	0.4	0-30	10/3/2017	10/9/2017
beta-BHC	0.475	ug/L	0.5	95.0	1.5	0-30	10/3/2017	10/9/2017
delta-BHC	0.474	ug/L	0.5	94.8	2.1	0-30	10/3/2017	10/9/2017
4,4-DDD	0.440	ug/L	0.5	88.0	2.1	0-30	10/3/2017	10/9/2017
Endosulfan I	0.470	ug/L	0.5	94.0	1.9	0-30	10/3/2017	10/9/2017
Methoxychlor	0.486	ug/L	0.5	97.2	1.5	0-30	10/3/2017	10/9/2017
Endosulfan sulfate	0.469	ug/L	0.5	93.8	3.0	0-30	10/3/2017	10/9/2017
Endrin	0.473	ug/L	0.5	94.6	1.9	0-30	10/3/2017	10/9/2017
Endrin aldehyde	0.445	ug/L	0.5	89.0	2.3	0-30	10/3/2017	10/9/2017
Endrin ketone	0.483	ug/L	0.5	96.6	1.7	0-30	10/3/2017	10/9/2017
gamma-BHC (Lindane)	0.483	ug/L	0.5	96.6	1.0	0-30	10/3/2017	10/9/2017
Heptachlor	0.439	ug/L	0.5	87.8	1.1	0-30	10/3/2017	10/9/2017
Heptachlor epoxide	0.461	ug/L	0.5	92.2	1.5	0-30	10/3/2017	10/9/2017
Dieldrin	0.467	ug/L	0.5	93.4	2.6	0-30	10/3/2017	10/9/2017

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
4,4-DDD	ND	ug/L	0.01	10/3/2017	10/9/2017
4,4-DDE	ND	ug/L	0.01	10/3/2017	10/9/2017
4,4-DDT	ND	ug/L	0.01	10/3/2017	10/9/2017
Aldrin	ND	ug/L	0.01	10/3/2017	10/9/2017

Comments:

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
alpha-BHC	ND	ug/L	0.01	10/3/2017	10/9/2017
Aroclor 1016 (PCB-1016)	ND	ug/L	0.2	10/3/2017	10/9/2017
Aroclor 1221 (PCB-1221)	ND	ug/L	0.2	10/3/2017	10/9/2017
Aroclor 1232 (PCB-1232)	ND	ug/L	0.2	10/3/2017	10/9/2017
Aroclor 1242 (PCB-1242)	ND	ug/L	0.2	10/3/2017	10/9/2017
Aroclor 1248 (PCB-1248)	ND	ug/L	0.2	10/3/2017	10/9/2017
Aroclor 1254 (PCB-1254)	ND	ug/L	0.2	10/3/2017	10/9/2017
Aroclor 1260 (PCB-1260)	ND	ug/L	0.2	10/3/2017	10/9/2017
beta-BHC	ND	ug/L	0.01	10/3/2017	10/9/2017
Chlordane	ND	ug/L	0.1	10/3/2017	10/9/2017
delta-BHC	ND	ug/L	0.01	10/3/2017	10/9/2017
Dieldrin	ND	ug/L	0.01	10/3/2017	10/9/2017
Endosulfan I	ND	ug/L	0.01	10/3/2017	10/9/2017
Endosulfan II	ND	ug/L	0.01	10/3/2017	10/9/2017
Endosulfan sulfate	ND	ug/L	0.01	10/3/2017	10/9/2017
Endrin	ND	ug/L	0.01	10/3/2017	10/9/2017
Endrin aldehyde	ND	ug/L	0.01	10/3/2017	10/9/2017
Endrin ketone	ND	ug/L	0.01	10/3/2017	10/9/2017
gamma-BHC (Lindane)	ND	ug/L	0.01	10/3/2017	10/9/2017
Heptachlor	ND	ug/L	0.01	10/3/2017	10/9/2017
Heptachlor epoxide	ND	ug/L	0.01	10/3/2017	10/9/2017
Methoxychlor	ND	ug/L	0.01	10/3/2017	10/9/2017
Toxaphene	ND	ug/L	0.1	10/3/2017	10/9/2017

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-002	**Sampling Date**	9/28/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-001B / RIO GRANDE-SOUTH-20170928			**Extraction Date**	10/5/2017
Matrix	Water	**Sampling Time**	9:00 AM		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	B1
Chrysene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	10/10/2017	HSW	EPA 8270D	

Surrogate Data

Sample Number 171003037-002

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	79.4	43-120
2-Fluorobiphenyl	EPA 8270D	85.6	55-127
2-Fluorophenol	EPA 8270D	71.2	41-119
Nitrobenzene-d5	EPA 8270D	90.0	55-120
Phenol-d5	EPA 8270D	70.6	52-115
Terphenyl-d14	EPA 8270D	111.2	22-133

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-005	**Sampling Date**	9/27/2017	**Date/Time Received**	10/3/20172:05 PM
Client Sample ID	1709F81-003B / RIO GRANDE-NORTH-20170927			**Extraction Date**	10/3/2017
Matrix	Water	**Sampling Time**	12:00 PM		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	3.06	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	10/5/2017	HSW	EPA 8270D	

Surrogate Data

Sample Number 171003037-005

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	94.4	43-120
2-Fluorobiphenyl	EPA 8270D	94.4	55-127
2-Fluorophenol	EPA 8270D	78.6	41-119
Nitrobenzene-d5	EPA 8270D	90.4	55-120
Phenol-d5	EPA 8270D	83.6	52-115
Terphenyl-d14	EPA 8270D	108.4	22-133

Authorized Signature

Todd Taruscio, Lab Manager

B1	Target analyte detected in method blank at or above the method reporting limit
MCL	EPA's Maximum Contaminant Level
ND	Not Detected
PQL	Practical Quantitation Limit

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The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Pentachlorophenol	4.86	ug/L	5	97.2	22-138	10/5/2017	10/10/2017
bis(2-Ethylhexyl)phthalate	4.76	ug/L	5	95.2	51-149	10/5/2017	10/10/2017
Pentachlorophenol	8.93	ug/L	10	89.3	22-138	10/2/2017	10/5/2017
bis(2-Ethylhexyl)phthalate	9.98	ug/L	10	99.8	51-149	10/2/2017	10/5/2017

Lab Control Sample Duplicate

Parameter	LCSD Result	Units	LCSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Pentachlorophenol	4.83	ug/L	5	96.6	0.6	0-47	10/5/2017	10/10/2017
bis(2-Ethylhexyl)phthalate	4.56	ug/L	5	91.2	4.3	0-50	10/5/2017	10/10/2017
Pentachlorophenol	7.83	ug/L	10	78.3	13.1	0-47	10/2/2017	10/5/2017
bis(2-Ethylhexyl)phthalate	10.5	ug/L	10	105.0	5.1	0-50	10/2/2017	10/5/2017

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Benzidine	ND	ug/L	0.5	10/5/2017	10/10/2017
Benzidine	ND	ug/L	0.5	10/2/2017	10/5/2017
Benzo[a]anthracene	ND	ug/L	0.5	10/2/2017	10/5/2017
Benzo[a]anthracene	ND	ug/L	0.5	10/5/2017	10/10/2017
Benzo[a]pyrene	ND	ug/L	0.5	10/2/2017	10/5/2017
Benzo[a]pyrene	ND	ug/L	0.5	10/5/2017	10/10/2017
Benzo[b]fluoranthene	ND	ug/L	0.5	10/2/2017	10/5/2017
Benzo[b]fluoranthene	ND	ug/L	0.5	10/5/2017	10/10/2017
Benzo[k]fluoranthene	ND	ug/L	0.5	10/5/2017	10/10/2017
Benzo[k]fluoranthene	ND	ug/L	0.5	10/2/2017	10/5/2017
bis(2-Ethylhexyl)phthalate	0.57	ug/L	0.5	10/5/2017	10/10/2017
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	10/2/2017	10/5/2017
Chrysene	ND	ug/L	0.5	10/2/2017	10/5/2017
Chrysene	ND	ug/L	0.5	10/5/2017	10/10/2017
Dibenz[a,h]anthracene	ND	ug/L	0.5	10/2/2017	10/5/2017
Dibenz[a,h]anthracene	ND	ug/L	0.5	10/5/2017	10/10/2017
Dibenzofuran	ND	ug/L	0.5	10/2/2017	10/5/2017
Dibenzofuran	ND	ug/L	0.5	10/5/2017	10/10/2017

Comments:

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	10/2/2017	10/5/2017
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	10/5/2017	10/10/2017
Pentachlorophenol	ND	ug/L	0.5	10/5/2017	10/10/2017
Pentachlorophenol	ND	ug/L	0.5	10/2/2017	10/5/2017

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Anatek Labs, Inc.

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	171003037-003	**Sampling Date**	9/28/2017	**Date/Time Received**	10/3/2017 2:05 PM
Client Sample ID	1709F81-001I / RIO GRANDE-SOUTH-20170928			**Sampling Time**	9:00 AM
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
COD	36.2	mg/L	5	10/25/2017 7:05:00 PM	KAE	EPA 410.4	

Sample Number	171003037-006	**Sampling Date**	9/27/2017	**Date/Time Received**	10/3/2017 2:05 PM
Client Sample ID	1709F81-003I / RIO GRANDE-NORTH-20170927			**Sampling Time**	12:00 PM
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
COD	20.5	mg/L	5	10/25/2017 7:05:00 PM	KAE	EPA 410.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL	EPA's Maximum Contaminant Level
ND	Not Detected
PQL	Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	171003037
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1709F81
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
COD	94.4	mg/L	100	94.4	90-110	10/25/2017	10/25/2017

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
171010049-001	COD	6.95	102	mg/L	100	95.1	80-120	10/25/2017	10/25/2017

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
COD	101	mg/L	100	94.1	1.0	0-15	10/25/2017	10/25/2017

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
COD	<5	mg/L	5	10/25/2017	10/25/2017

Duplicate

Sample Number	Parameter	Sample Result	Duplicate Result	Units	%RPD	AR %RPD	Prep Date	Analysis Date
171011019-001	COD	<5	5.93	mg/L	0.0	0-20	10/25/2017	10/25/2017

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Wet Chemistry by Method 3500Cr C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		0.000500	1	10/03/2017 20:27	WG1026374

Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

SAMPLE RESULTS - 02

Wet Chemistry by Method 3500Cr C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		0.000500	1	10/03/2017 20:35	WG1026374

Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Method Blank (MB)

(MB) R3254611-1 10/03/17 15:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hexavalent Chromium	U		0.00015	0.000500

L939889-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939889-01 10/03/17 17:07 • (DUP) R3254611-8 10/03/17 17:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	0.000182	1	0		20

L940315-01 Original Sample (OS) • Duplicate (DUP)

(OS) L940315-01 10/03/17 19:51 • (DUP) R3254611-11 10/03/17 20:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	0.000	1	0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3254611-5 10/03/17 15:32 • (LCSD) R3254611-6 10/03/17 15:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	0.00200	0.00189	0.00183	95	91	90-110			4	20

L940091-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940091-03 10/03/17 18:37 • (MS) R3254611-9 10/03/17 18:45 • (MSD) R3254611-10 10/03/17 18:53

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	0.0500	ND	0.0330	0.0498	66	100	1	90-110	J6	J3	41	20

L940318-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L940318-01 10/03/17 20:11 • (MS) R3254611-12 10/03/17 20:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	0.0500	ND	0.0488	98	1	90-110	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

CFA | Cape Fear Analytical LLC
an affiliate of The GEL Group INC

3306 Kitty Hawk Road, Suite 120 Wilmington, NC 28405
P 910.795.0421

www.capefearanalytical.com

October 26, 2017

Mr. Andy Freeman
Hall Environmental
4901 Hawkins NE
Suite D
Albuquerque, New Mexico 87109

Re: Routine Analysis
Work Order: 11458
SDG: 1709F81

Dear Mr. Freeman:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 06, 2017. This original data report has been prepared and reviewed in accordance with CFA's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at 910-795-0421.

Sincerely,

Cynde Larkins

Cynde Larkins
Project Manager

Purchase Order: IDIQ Pricing
Enclosures

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107
Website: www.hallenvironmental.com

SUB CONTRATOR: Cape Fear Analytical	COMPANY: Cape Fear Analytical	PHONE: (910) 795-0421	FAX:
ADDRESS: 3306 Kitty Hawk Rd Ste 120		ACCOUNT #:	EMAIL:
CITY, STATE, ZIP: Wilmington, NC 28405			

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	1709F81-001K	Rio Grande-South-20170928	1x Hr Amber	Aqueous	9/28/2017 9:00:00 AM	1	PCB CONGENERS PREP 1668
2	1709F81-003K	Rio Grande-North-20170927	1x Hr Amber	Aqueous	9/27/2017 12:00:00 PM	1	PCB CONGENERS PREP 1668

AT 09/29/17

CFA WO#11458

SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By	Date	Time	Received By	Date	Time
[signature]	9/29/2017	8:52 AM	Cynde Larkins	30OCT17	0946
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ✓ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples: 1.3 °C Attempt to Cool ? ________
Comments: ________

SAMPLE RECEIPT CHECKLIST
Cape Fear Analytical

Client: HALL	Work Order: 11458
Shipping Company: FedEx	Date/Time Received: 06OCT17 0946

Suspected Hazard Information	Yes	NA	No
Shipped as DOT Hazardous?			✓
Samples identified as Foreign Soil?			✓

DOE Site Sample Packages	Yes	NA	No*
Screened <0.5 mR/hr?		✓	
Samples < 2x background?		✓	

* Notify RSO of any responses in this column immediately.

Air Sample Receipt Specifics	Yes	NA	No
Air sample in shipment?			✓

Air Witness: ______________

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other(describe)
2	Chain of Custody documents included with shipment?	✓			
3	Samples requiring cold preservation within 0-6°C?	✓			Preservation Method: ice bags blue ice dry ice none other (describe) 6.2° - 4.9 = 1.3°C
4	Aqueous samples found to have visible solids?	✓			Sample IDs, containers affected: Minimal visible solids (<1%) in both samples
5	Samples requiring chemical preservation at proper pH?		✓		Sample IDs, containers affected and pH observed: pH = 8 on all jars. If preservative added, Lot#:
6	Samples requiring preservation have no residual chlorine?	✓			Sample IDs, containers affected: If preservative added, Lot#:
7	Samples received within holding time?	✓			Sample IDs, tests affected:
8	Sample IDs on COC match IDs on containers?	✓			Sample IDs, containers affected:
9	Date & time of COC match date & time on containers?	✓			Sample IDs, containers affected:
10	Number of containers received match number indicated on COC?			✓	List type and number of containers / Sample IDs, containers affected: 2 - 1LWMA per sample
11	COC form is properly signed in relinquished/received sections?	✓			

Comments:

Checklist performed by: Initials: CY Date: 06OCT17

CF-UD-F-7

PCB Congeners Analysis

Case Narrative

PCBC Case Narrative
Hall Environmental Analysis Laboratory (HALL)
SDG 1709F81
Work Order 11458

Method/Analysis Information

Product:	**Method 1668C HRMS Aqueous Analysis**
Analytical Method:	EPA Method 1668C
Extraction Method:	SW846 3520C
Analytical Batch Number:	36029
Clean Up Batch Number:	35955
Extraction Batch Number:	35954

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA Method 1668C:

Sample ID	Client ID
11458001	1709F81-001K Rio Grande-South-21070928
11458002	1709F81-003K Rio Grande-North-20170927
12019813	Method Blank (MB)
12019814	Laboratory Control Sample (LCS)
12019815	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-003 REV# 6.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Certification Statement
The test results presented in this document are certified to meet all requirements of the 2009 TNI Standard.

Method Blank (MB) Statement
The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery
The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement
The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation
A matrix spike and matrix spike duplicate analysis was not required for this SDG.

Technical Information

Holding Time Specifications
CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Nonconformance (NCR) Documentation
A NCR was not required for this SDG.

Manual Integrations
Manual integrations were required for data files in this SDG. Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

System Configuration
This analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
HRP875_1	PCB Analysis	PCB Analysis	SPB-Octyl	30m x 0.25mm, 0.25um

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Sample Data Summary

Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

Certificate of Analysis Report
for

HALL001 Hall Environmental Analysis Laboratory

Client SDG: 1709F81 CFA Work Order: 11458

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- C Congener has coeluters. When Cxxx, refer to congener number xxx for data
- J Value is estimated
- U Analyte was analyzed for, but not detected above the specified detection limit.

Review/Validation

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

The following data validator verified the information presented in this case narrative:

Signature: Heather Patterson **Name: Heather Patterson**

Date: 26 OCT 2017 **Title: Group Leader**

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458001	**Date Collected:**	09/28/2017 09:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-001K Rio Grande-South-210			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 10:46	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	879 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB	U	ND	pg/L	3.30	22.8
2051-61-8	2-MoCB	U	ND	pg/L	2.34	22.8
2051-62-9	3-MoCB	J	2.94	pg/L	2.28	22.8
13029-08-8	4-DiCB	U	ND	pg/L	8.40	22.8
16605-91-7	5-DiCB	U	ND	pg/L	8.69	22.8
25569-80-6	6-DiCB	U	ND	pg/L	7.08	22.8
33284-50-3	7-DiCB	U	ND	pg/L	7.42	22.8
34883-43-7	8-DiCB	U	ND	pg/L	6.28	22.8
34883-39-1	9-DiCB	U	ND	pg/L	8.05	22.8
33146-45-1	10-DiCB	U	ND	pg/L	4.62	22.8
2050-67-1	11-DiCB		116	pg/L	8.01	114
2974-92-7	12-DiCB	CU	ND	pg/L	7.83	45.5
2974-90-5	13-DiCB	C12				
34883-41-5	14-DiCB	U	ND	pg/L	7.53	22.8
2050-68-2	15-DiCB	U	ND	pg/L	7.53	22.8
38444-78-9	16-TrCB	J	2.98	pg/L	2.84	22.8
37680-66-3	17-TrCB	J	3.96	pg/L	2.73	22.8
37680-65-2	18-TrCB	CJ	6.46	pg/L	2.21	45.5
38444-73-4	19-TrCB	U	ND	pg/L	3.96	22.8
38444-84-7	20-TrCB	CJ	14.9	pg/L	1.87	45.5
55702-46-0	21-TrCB	CJ	5.32	pg/L	1.77	45.5
38444-85-8	22-TrCB	J	6.99	pg/L	1.89	22.8
55720-44-0	23-TrCB	U	ND	pg/L	1.87	22.8
55702-45-9	24-TrCB	U	ND	pg/L	1.96	22.8
55712-37-3	25-TrCB	U	ND	pg/L	1.64	22.8
38444-81-4	26-TrCB	CJ	2.03	pg/L	1.82	45.5
38444-76-7	27-TrCB	U	ND	pg/L	1.93	22.8
7012-37-5	28-TrCB	C20				
15862-07-4	29-TrCB	C26				
35693-92-6	30-TrCB	C18				
16606-02-3	31-TrCB	U	ND	pg/L	8.94	22.8
38444-77-8	32-TrCB	J	2.28	pg/L	1.73	22.8

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**11458001**	**Date Collected:**	**09/28/2017 09:00**	**Matrix:**	**WATER**
Client Sample:	**1668C Water**	**Date Received:**	**10/06/2017 09:46**		
Client ID:	**1709F81-001K Rio Grande-South-210**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/21/2017 10:46**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d21oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**879 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
38444-86-9	33-TrCB	C21				
37680-68-5	34-TrCB	U	ND	pg/L	1.93	22.8
37680-69-6	35-TrCB	J	4.32	pg/L	3.09	22.8
38444-87-0	36-TrCB	U	ND	pg/L	2.75	22.8
38444-90-5	37-TrCB	J	8.69	pg/L	2.87	22.8
53555-66-1	38-TrCB	U	ND	pg/L	2.84	22.8
38444-88-1	39-TrCB	U	ND	pg/L	2.75	22.8
38444-93-8	40-TeCB	CJ	6.51	pg/L	4.12	45.5
52663-59-9	41-TeCB	U	ND	pg/L	4.44	22.8
36559-22-5	42-TeCB	U	ND	pg/L	4.53	22.8
70362-46-8	43-TeCB	U	ND	pg/L	5.42	22.8
41464-39-5	44-TeCB	CJ	21.0	pg/L	3.91	68.3
70362-45-7	45-TeCB	CJ	2.62	pg/L	1.41	45.5
41464-47-5	46-TeCB	U	ND	pg/L	1.46	22.8
2437-79-8	47-TeCB	C44				
70362-47-9	48-TeCB	U	ND	pg/L	4.21	22.8
41464-40-8	49-TeCB	CJ	8.71	pg/L	3.69	45.5
62796-65-0	50-TeCB	CU	ND	pg/L	1.77	45.5
68194-04-7	51-TeCB	C45				
35693-99-3	52-TeCB	J	20.7	pg/L	3.91	22.8
41464-41-9	53-TeCB	C50				
15968-05-5	54-TeCB	U	ND	pg/L	1.27	22.8
74338-24-2	55-TeCB	U	ND	pg/L	2.53	22.8
41464-43-1	56-TeCB	J	9.06	pg/L	2.64	22.8
70424-67-8	57-TeCB	U	ND	pg/L	2.43	22.8
41464-49-7	58-TeCB	U	ND	pg/L	2.41	22.8
74472-33-6	59-TeCB	CU	ND	pg/L	3.16	68.3
33025-41-1	60-TeCB	J	5.01	pg/L	2.48	22.8
33284-53-6	61-TeCB	CJ	32.4	pg/L	2.41	91.0
54230-22-7	62-TeCB	C59				
74472-34-7	63-TeCB	U	ND	pg/L	2.32	22.8
52663-58-8	64-TeCB	J	7.76	pg/L	3.07	22.8

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**11458001**	**Date Collected:**	**09/28/2017 09:00**	**Matrix:**	**WATER**
Client Sample:	**1668C Water**	**Date Received:**	**10/06/2017 09:46**		
Client ID:	**1709F81-001K Rio Grande-South-210**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/21/2017 10:46**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d21oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**879 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
33284-54-7	65-TeCB	C44				
32598-10-0	66-TeCB	J	13.4	pg/L	2.37	22.8
73575-53-8	67-TeCB	U	ND	pg/L	2.25	22.8
73575-52-7	68-TeCB	U	ND	pg/L	2.23	22.8
60233-24-1	69-TeCB	C49				
32598-11-1	70-TeCB	C61				
41464-46-4	71-TeCB	C40				
41464-42-0	72-TeCB	U	ND	pg/L	2.30	22.8
74338-23-1	73-TeCB	U	ND	pg/L	3.23	22.8
32690-93-0	74-TeCB	C61				
32598-12-2	75-TeCB	C59				
70362-48-0	76-TeCB	C61				
32598-13-3	77-TeCB	U	ND	pg/L	5.46	22.8
70362-49-1	78-TeCB	U	ND	pg/L	2.43	22.8
41464-48-6	79-TeCB	U	ND	pg/L	2.16	22.8
33284-52-5	80-TeCB	U	ND	pg/L	2.07	22.8
70362-50-4	81-TeCB	U	ND	pg/L	2.28	22.8
52663-62-4	82-PeCB	U	ND	pg/L	4.48	22.8
60145-20-2	83-PeCB	U	ND	pg/L	3.89	22.8
52663-60-2	84-PeCB	J	8.21	pg/L	4.19	22.8
65510-45-4	85-PeCB	CJ	8.40	pg/L	3.00	68.3
55312-69-1	86-PeCB	CJ	28.3	pg/L	3.19	137
38380-02-8	87-PeCB	C86				
55215-17-3	88-PeCB	CJ	4.62	pg/L	3.78	45.5
73575-57-2	89-PeCB	U	ND	pg/L	3.94	22.8
68194-07-0	90-PeCB	CJ	33.0	pg/L	3.12	68.3
68194-05-8	91-PeCB	C88				
52663-61-3	92-PeCB	J	6.37	pg/L	3.64	22.8
73575-56-1	93-PeCB	CU	ND	pg/L	3.66	45.5
73575-55-0	94-PeCB	U	ND	pg/L	4.07	22.8
38379-99-6	95-PeCB		23.8	pg/L	3.66	22.8
73575-54-9	96-PeCB	U	ND	pg/L	0.865	22.8

Comments:
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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458001	**Date Collected:**	09/28/2017 09:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-001K Rio Grande-South-210			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 10:46	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	879 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
41464-51-1	97-PeCB	C86				
60233-25-2	98-PeCB	CU	ND	pg/L	3.94	45.5
38380-01-7	99-PeCB	J	12.0	pg/L	3.28	22.8
39485-83-1	100-PeCB	C93				
37680-73-2	101-PeCB	C90				
68194-06-9	102-PeCB	C98				
60145-21-3	103-PeCB	U	ND	pg/L	3.37	22.8
56558-16-8	104-PeCB	U	ND	pg/L	0.887	22.8
32598-14-4	105-PeCB	J	16.6	pg/L	2.00	22.8
70424-69-0	106-PeCB	U	ND	pg/L	1.84	22.8
70424-68-9	107-PeCB	J	2.84	pg/L	1.59	22.8
70362-41-3	108-PeCB	CJ	2.00	pg/L	1.84	45.5
74472-35-8	109-PeCB	C86				
38380-03-9	110-PeCB	C	49.1	pg/L	2.96	45.5
39635-32-0	111-PeCB	U	ND	pg/L	2.80	22.8
74472-36-9	112-PeCB	U	ND	pg/L	2.71	22.8
68194-10-5	113-PeCB	C90				
74472-37-0	114-PeCB	U	ND	pg/L	1.93	22.8
74472-38-1	115-PeCB	C110				
18259-05-7	116-PeCB	C85				
68194-11-6	117-PeCB	C85				
31508-00-6	118-PeCB		34.3	pg/L	1.89	22.8
56558-17-9	119-PeCB	C86				
68194-12-7	120-PeCB	U	ND	pg/L	2.66	22.8
56558-18-0	121-PeCB	U	ND	pg/L	2.84	22.8
76842-07-4	122-PeCB	U	ND	pg/L	1.93	22.8
65510-44-3	123-PeCB	U	ND	pg/L	1.84	22.8
70424-70-3	124-PeCB	C108				
74472-39-2	125-PeCB	C86				
57465-28-8	126-PeCB	U	ND	pg/L	2.23	22.8
39635-33-1	127-PeCB	U	ND	pg/L	1.89	22.8
38380-07-3	128-HxCB	CJ	11.0	pg/L	2.66	45.5

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**11458001**	**Date Collected:**	**09/28/2017 09:00**	**Matrix:**	**WATER**
Client Sample:	**1668C Water**	**Date Received:**	**10/06/2017 09:46**		
Client ID:	**1709F81-001K Rio Grande-South-210**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/21/2017 10:46**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d21oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**879 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
55215-18-4	129-HxCB	C	75.9	pg/L	2.75	68.3
52663-66-8	130-HxCB	U	ND	pg/L	3.82	22.8
61798-70-7	131-HxCB	U	ND	pg/L	3.39	22.8
38380-05-1	132-HxCB	J	20.4	pg/L	3.30	22.8
35694-04-3	133-HxCB	U	ND	pg/L	3.07	22.8
52704-70-8	134-HxCB	U	ND	pg/L	3.41	22.8
52744-13-5	135-HxCB	CJ	19.8	pg/L	1.57	45.5
38411-22-2	136-HxCB	J	6.21	pg/L	1.14	22.8
35694-06-5	137-HxCB	J	3.34	pg/L	3.07	22.8
35065-28-2	138-HxCB	C129				
56030-56-9	139-HxCB	CU	ND	pg/L	2.84	45.5
59291-64-4	140-HxCB	C139				
52712-04-6	141-HxCB	J	12.7	pg/L	3.19	22.8
41411-61-4	142-HxCB	U	ND	pg/L	3.44	22.8
68194-15-0	143-HxCB	U	ND	pg/L	3.34	22.8
68194-14-9	144-HxCB	J	3.05	pg/L	1.52	22.8
74472-40-5	145-HxCB	U	ND	pg/L	1.21	22.8
51908-16-8	146-HxCB	J	8.76	pg/L	2.50	22.8
68194-13-8	147-HxCB	CJ	40.7	pg/L	2.91	45.5
74472-41-6	148-HxCB	U	ND	pg/L	1.59	22.8
38380-04-0	149-HxCB	C147				
68194-08-1	150-HxCB	U	ND	pg/L	1.18	22.8
52663-63-5	151-HxCB	C135				
68194-09-2	152-HxCB	U	ND	pg/L	1.11	22.8
35065-27-1	153-HxCB	C	56.4	pg/L	2.32	45.5
60145-22-4	154-HxCB	U	ND	pg/L	1.37	22.8
33979-03-2	155-HxCB	U	ND	pg/L	1.18	22.8
38380-08-4	156-HxCB	CJ	9.35	pg/L	2.05	45.5
69782-90-7	157-HxCB	C156				
74472-42-7	158-HxCB	J	7.39	pg/L	2.09	22.8
39635-35-3	159-HxCB	U	ND	pg/L	1.62	22.8
41411-62-5	160-HxCB	U	ND	pg/L	2.62	22.8

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**11458001**	**Date Collected:**	**09/28/2017 09:00**	**Matrix:**	**WATER**
Client Sample:	**1668C Water**	**Date Received:**	**10/06/2017 09:46**		
Client ID:	**1709F81-001K Rio Grande-South-210**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/21/2017 10:46**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d21oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**879 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
74472-43-8	161-HxCB	U	ND	pg/L	2.32	22.8
39635-34-2	162-HxCB	U	ND	pg/L	1.66	22.8
74472-44-9	163-HxCB	C129				
74472-45-0	164-HxCB	J	4.55	pg/L	2.28	22.8
74472-46-1	165-HxCB	U	ND	pg/L	2.48	22.8
41411-63-6	166-HxCB	C128				
52663-72-6	167-HxCB	J	3.59	pg/L	1.59	22.8
59291-65-5	168-HxCB	C153				
32774-16-6	169-HxCB	U	ND	pg/L	1.73	22.8
35065-30-6	170-HpCB	J	19.6	pg/L	2.46	22.8
52663-71-5	171-HpCB	CJ	6.12	pg/L	2.41	45.5
52663-74-8	172-HpCB	J	3.73	pg/L	2.41	22.8
68194-16-1	173-HpCB	C171				
38411-25-5	174-HpCB	J	20.8	pg/L	2.37	22.8
40186-70-7	175-HpCB	U	ND	pg/L	1.25	22.8
52663-65-7	176-HpCB	J	2.57	pg/L	0.978	22.8
52663-70-4	177-HpCB	J	12.8	pg/L	2.32	22.8
52663-67-9	178-HpCB	J	4.41	pg/L	1.34	22.8
52663-64-6	179-HpCB	J	7.17	pg/L	0.956	22.8
35065-29-3	180-HpCB	C	47.6	pg/L	1.96	45.5
74472-47-2	181-HpCB	U	ND	pg/L	2.23	22.8
60145-23-5	182-HpCB	U	ND	pg/L	1.25	22.8
52663-69-1	183-HpCB	CJ	14.1	pg/L	2.23	45.5
74472-48-3	184-HpCB	U	ND	pg/L	0.956	22.8
52712-05-7	185-HpCB	C183				
74472-49-4	186-HpCB	U	ND	pg/L	1.02	22.8
52663-68-0	187-HpCB		23.8	pg/L	1.21	22.8
74487-85-7	188-HpCB	U	ND	pg/L	1.00	22.8
39635-31-9	189-HpCB	U	ND	pg/L	1.34	22.8
41411-64-7	190-HpCB	J	4.82	pg/L	1.84	22.8
74472-50-7	191-HpCB	U	ND	pg/L	1.71	22.8
74472-51-8	192-HpCB	U	ND	pg/L	1.98	22.8

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458001	**Date Collected:**	09/28/2017 09:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-001K Rio Grande-South-210			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 10:46	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	879 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
69782-91-8	193-HpCB	C180				
35694-08-7	194-OcCB	J	9.87	pg/L	1.32	22.8
52663-78-2	195-OcCB	J	3.91	pg/L	1.41	22.8
42740-50-1	196-OcCB	J	4.10	pg/L	1.55	22.8
33091-17-7	197-OcCB	CJ	2.64	pg/L	1.18	45.5
68194-17-2	198-OcCB	CJ	12.6	pg/L	1.62	45.5
52663-75-9	199-OcCB	C198				
52663-73-7	200-OcCB	C197				
40186-71-8	201-OcCB	J	1.68	pg/L	1.16	22.8
2136-99-4	202-OcCB	J	2.68	pg/L	1.30	22.8
52663-76-0	203-OcCB	J	6.26	pg/L	1.48	22.8
74472-52-9	204-OcCB	U	ND	pg/L	1.18	22.8
74472-53-0	205-OcCB	J	1.11	pg/L	1.02	22.8
40186-72-9	206-NoCB	J	5.85	pg/L	1.84	22.8
52663-79-3	207-NoCB	U	ND	pg/L	1.46	22.8
52663-77-1	208-NoCB	J	2.64	pg/L	1.37	22.8
2051-24-3	209-DeCB	J	5.05	pg/L	1.55	22.8
1336-36-3	Total PCB Congeners	J	1040	pg/L	7.60	22.8

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		1320	2280	pg/L	57.8	(5%-145%)
13C-3-MoCB		1510	2280	pg/L	66.6	(5%-145%)
13C-4-DiCB		1650	2280	pg/L	72.4	(5%-145%)
13C-15-DiCB		3200	2280	pg/L	141	(5%-145%)
13C-19-TrCB		2460	2280	pg/L	108	(5%-145%)
13C-37-TrCB		2290	2280	pg/L	101	(5%-145%)
13C-54-TeCB		1410	2280	pg/L	62.2	(5%-145%)
13C-77-TeCB		2380	2280	pg/L	104	(10%-145%)
13C-81-TeCB		2350	2280	pg/L	103	(10%-145%)
13C-104-PeCB		1860	2280	pg/L	81.6	(10%-145%)
13C-105-PeCB		1940	2280	pg/L	85.5	(10%-145%)
13C-114-PeCB		1870	2280	pg/L	82.4	(10%-145%)
13C-118-PeCB		1860	2280	pg/L	81.7	(10%-145%)
13C-123-PeCB		1950	2280	pg/L	85.7	(10%-145%)
13C-126-PeCB		1980	2280	pg/L	87.1	(10%-145%)
13C-155-HxCB		1860	2280	pg/L	81.9	(10%-145%)
13C-156-HxCB	C	3640	4550	pg/L	79.9	(10%-145%)
13C-157-HxCB	C156L					
13C-167-HxCB		1900	2280	pg/L	83.3	(10%-145%)
13C-169-HxCB		2010	2280	pg/L	88.3	(10%-145%)
13C-188-HpCB		1740	2280	pg/L	76.4	(10%-145%)
13C-189-HpCB		1750	2280	pg/L	77.0	(10%-145%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458001	**Date Collected:**	09/28/2017 09:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-001K Rio Grande-South-210			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 10:46	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	879 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		1690	2280	pg/L	74.2	(10%-145%)
13C-205-OcCB		2210	2280	pg/L	97.3	(10%-145%)
13C-206-NoCB		2400	2280	pg/L	105	(10%-145%)
13C-208-NoCB		2050	2280	pg/L	89.9	(10%-145%)
13C-209-DeCB		2310	2280	pg/L	102	(10%-145%)
13C-28-TrCB		1310	2280	pg/L	57.4	(5%-145%)
13C-111-PeCB		2020	2280	pg/L	88.9	(10%-145%)
13C-178-HpCB		2070	2280	pg/L	91.1	(10%-145%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**11458002**	**Date Collected:**	**09/28/2017 12:00**	**Matrix:**	**WATER**
Client Sample:	**1668C Water**	**Date Received:**	**10/06/2017 09:46**		
Client ID:	**1709F81-003K Rio Grande-North-20**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/21/2017 11:55**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d21oct17a-5**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**946.6 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB	U	ND	pg/L	2.01	21.1
2051-61-8	2-MoCB	U	ND	pg/L	3.15	21.1
2051-62-9	3-MoCB	U	ND	pg/L	2.07	21.1
13029-08-8	4-DiCB	U	ND	pg/L	9.04	21.1
16605-91-7	5-DiCB	U	ND	pg/L	9.93	21.1
25569-80-6	6-DiCB	U	ND	pg/L	8.09	21.1
33284-50-3	7-DiCB	U	ND	pg/L	8.47	21.1
34883-43-7	8-DiCB	U	ND	pg/L	7.16	21.1
34883-39-1	9-DiCB	U	ND	pg/L	9.19	21.1
33146-45-1	10-DiCB	U	ND	pg/L	5.26	21.1
2050-67-1	11-DiCB		120	pg/L	9.15	106
2974-92-7	12-DiCB	CU	ND	pg/L	8.94	42.3
2974-90-5	13-DiCB	C12				
34883-41-5	14-DiCB	U	ND	pg/L	8.62	21.1
2050-68-2	15-DiCB	U	ND	pg/L	8.73	21.1
38444-78-9	16-TrCB	U	ND	pg/L	3.66	21.1
37680-66-3	17-TrCB	J	3.59	pg/L	3.53	21.1
37680-65-2	18-TrCB	CJ	5.60	pg/L	2.85	42.3
38444-73-4	19-TrCB	U	ND	pg/L	4.25	21.1
38444-84-7	20-TrCB	CJ	8.60	pg/L	2.41	42.3
55702-46-0	21-TrCB	CU	ND	pg/L	3.34	42.3
38444-85-8	22-TrCB	U	ND	pg/L	4.50	21.1
55720-44-0	23-TrCB	U	ND	pg/L	2.41	21.1
55702-45-9	24-TrCB	U	ND	pg/L	2.51	21.1
55712-37-3	25-TrCB	U	ND	pg/L	2.11	21.1
38444-81-4	26-TrCB	CU	ND	pg/L	2.35	42.3
38444-76-7	27-TrCB	U	ND	pg/L	2.49	21.1
7012-37-5	28-TrCB	C20				
15862-07-4	29-TrCB	C26				
35693-92-6	30-TrCB	C18				
16606-02-3	31-TrCB	U	ND	pg/L	4.67	21.1
38444-77-8	32-TrCB	U	ND	pg/L	2.22	21.1

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	Client:	HALL001	Project:	HALL00117
Lab Sample ID:	11458002	Date Collected:	09/28/2017 12:00	Matrix:	WATER
Client Sample:	1668C Water	Date Received:	10/06/2017 09:46		
Client ID:	1709F81-003K Rio Grande-North-20			Prep Basis:	As Received
Batch ID:	36029	Method:	EPA Method 1668C		
Run Date:	10/21/2017 11:55	Analyst:	MJC	Instrument:	HRP875
Data File:	d21oct17a-5			Dilution:	1
Prep Batch:	35954	Prep Method:	SW846 3520C	Prep SOP Ref:	CF-OA-E-001
Prep Date:	17-OCT-17	Prep Aliquot:	946.6 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
38444-86-9	33-TrCB	C21				
37680-68-5	34-TrCB	U	ND	pg/L	2.49	21.1
37680-69-6	35-TrCB	U	ND	pg/L	4.58	21.1
38444-87-0	36-TrCB	U	ND	pg/L	2.79	21.1
38444-90-5	37-TrCB	U	ND	pg/L	3.11	21.1
53555-66-1	38-TrCB	U	ND	pg/L	2.89	21.1
38444-88-1	39-TrCB	U	ND	pg/L	2.81	21.1
38444-93-8	40-TeCB	CU	ND	pg/L	3.82	42.3
52663-59-9	41-TeCB	U	ND	pg/L	4.12	21.1
36559-22-5	42-TeCB	U	ND	pg/L	4.20	21.1
70362-46-8	43-TeCB	U	ND	pg/L	5.03	21.1
41464-39-5	44-TeCB	CJ	9.74	pg/L	3.63	63.4
70362-45-7	45-TeCB	CJ	2.07	pg/L	1.77	42.3
41464-47-5	46-TeCB	U	ND	pg/L	1.84	21.1
2437-79-8	47-TeCB	C44				
70362-47-9	48-TeCB	U	ND	pg/L	3.91	21.1
41464-40-8	49-TeCB	CU	ND	pg/L	3.42	42.3
62796-65-0	50-TeCB	CU	ND	pg/L	1.65	42.3
68194-04-7	51-TeCB	C45				
35693-99-3	52-TeCB	J	5.94	pg/L	3.63	21.1
41464-41-9	53-TeCB	C50				
15968-05-5	54-TeCB	U	ND	pg/L	1.37	21.1
74338-24-2	55-TeCB	U	ND	pg/L	2.43	21.1
41464-43-1	56-TeCB	U	ND	pg/L	3.08	21.1
70424-67-8	57-TeCB	U	ND	pg/L	2.32	21.1
41464-49-7	58-TeCB	U	ND	pg/L	2.32	21.1
74472-33-6	59-TeCB	CU	ND	pg/L	2.92	63.4
33025-41-1	60-TeCB	U	ND	pg/L	2.39	21.1
33284-53-6	61-TeCB	CJ	8.85	pg/L	2.32	84.5
54230-22-7	62-TeCB	C59				
74472-34-7	63-TeCB	U	ND	pg/L	2.24	21.1
52663-58-8	64-TeCB	U	ND	pg/L	2.83	21.1

Comments:

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Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458002	**Date Collected:**	09/28/2017 12:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-003K Rio Grande-North-20			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 11:55	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-5			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	946.6 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
33284-54-7	65-TeCB	C44				
32598-10-0	66-TeCB	J	4.08	pg/L	2.28	21.1
73575-53-8	67-TeCB	U	ND	pg/L	2.18	21.1
73575-52-7	68-TeCB	U	ND	pg/L	2.16	21.1
60233-24-1	69-TeCB	C49				
32598-11-1	70-TeCB	C61				
41464-46-4	71-TeCB	C40				
41464-42-0	72-TeCB	U	ND	pg/L	2.22	21.1
74338-23-1	73-TeCB	U	ND	pg/L	3.00	21.1
32690-93-0	74-TeCB	C61				
32598-12-2	75-TeCB	C59				
70362-48-0	76-TeCB	C61				
32598-13-3	77-TeCB	U	ND	pg/L	2.41	21.1
70362-49-1	78-TeCB	U	ND	pg/L	2.35	21.1
41464-48-6	79-TeCB	U	ND	pg/L	2.09	21.1
33284-52-5	80-TeCB	U	ND	pg/L	1.99	21.1
70362-50-4	81-TeCB	U	ND	pg/L	2.32	21.1
52663-62-4	82-PeCB	U	ND	pg/L	2.26	21.1
60145-20-2	83-PeCB	U	ND	pg/L	2.07	21.1
52663-60-2	84-PeCB	U	ND	pg/L	2.24	21.1
65510-45-4	85-PeCB	CU	ND	pg/L	1.61	63.4
55312-69-1	86-PeCB	CJ	4.10	pg/L	1.69	127
38380-02-8	87-PeCB	C86				
55215-17-3	88-PeCB	CU	ND	pg/L	2.01	42.3
73575-57-2	89-PeCB	U	ND	pg/L	2.09	21.1
68194-07-0	90-PeCB	CU	ND	pg/L	3.40	63.4
68194-05-8	91-PeCB	C88				
52663-61-3	92-PeCB	U	ND	pg/L	1.94	21.1
73575-56-1	93-PeCB	CU	ND	pg/L	1.94	42.3
73575-55-0	94-PeCB	U	ND	pg/L	2.18	21.1
38379-99-6	95-PeCB	J	3.00	pg/L	1.96	21.1
73575-54-9	96-PeCB	U	ND	pg/L	1.01	21.1

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**11458002**	**Date Collected:**	**09/28/2017 12:00**	**Matrix:**	**WATER**
Client Sample:	**1668C Water**	**Date Received:**	**10/06/2017 09:46**		
Client ID:	**1709F81-003K Rio Grande-North-20**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/21/2017 11:55**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d21oct17a-5**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**946.6 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
41464-51-1	97-PeCB	C86				
60233-25-2	98-PeCB	CU	ND	pg/L	2.09	42.3
38380-01-7	99-PeCB	U	ND	pg/L	1.73	21.1
39485-83-1	100-PeCB	C93				
37680-73-2	101-PeCB	C90				
68194-06-9	102-PeCB	C98				
60145-21-3	103-PeCB	U	ND	pg/L	1.80	21.1
56558-16-8	104-PeCB	U	ND	pg/L	1.06	21.1
32598-14-4	105-PeCB	J	1.90	pg/L	1.86	21.1
70424-69-0	106-PeCB	U	ND	pg/L	1.69	21.1
70424-68-9	107-PeCB	U	ND	pg/L	1.46	21.1
70362-41-3	108-PeCB	CU	ND	pg/L	1.71	42.3
74472-35-8	109-PeCB	C86				
38380-03-9	110-PeCB	CJ	4.18	pg/L	1.56	42.3
39635-32-0	111-PeCB	U	ND	pg/L	1.48	21.1
74472-36-9	112-PeCB	U	ND	pg/L	1.44	21.1
68194-10-5	113-PeCB	C90				
74472-37-0	114-PeCB	U	ND	pg/L	1.84	21.1
74472-38-1	115-PeCB	C110				
18259-05-7	116-PeCB	C85				
68194-11-6	117-PeCB	C85				
31508-00-6	118-PeCB	J	2.66	pg/L	1.71	21.1
56558-17-9	119-PeCB	C86				
68194-12-7	120-PeCB	U	ND	pg/L	1.42	21.1
56558-18-0	121-PeCB	U	ND	pg/L	1.52	21.1
76842-07-4	122-PeCB	U	ND	pg/L	1.80	21.1
65510-44-3	123-PeCB	U	ND	pg/L	1.69	21.1
70424-70-3	124-PeCB	C108				
74472-39-2	125-PeCB	C86				
57465-28-8	126-PeCB	U	ND	pg/L	2.05	21.1
39635-33-1	127-PeCB	U	ND	pg/L	1.75	21.1
38380-07-3	128-HxCB	CU	ND	pg/L	1.75	42.3

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458002	**Date Collected:**	09/28/2017 12:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-003K Rio Grande-North-20			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 11:55	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-5			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	946.6 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
55215-18-4	129-HxCB	CJ	6.15	pg/L	1.82	63.4
52663-66-8	130-HxCB	U	ND	pg/L	2.18	21.1
61798-70-7	131-HxCB	U	ND	pg/L	2.24	21.1
38380-05-1	132-HxCB	U	ND	pg/L	2.18	21.1
35694-04-3	133-HxCB	U	ND	pg/L	2.03	21.1
52704-70-8	134-HxCB	U	ND	pg/L	2.26	21.1
52744-13-5	135-HxCB	CJ	2.01	pg/L	1.29	42.3
38411-22-2	136-HxCB	U	ND	pg/L	0.930	21.1
35694-06-5	137-HxCB	U	ND	pg/L	2.03	21.1
35065-28-2	138-HxCB	C129				
56030-56-9	139-HxCB	CU	ND	pg/L	1.88	42.3
59291-64-4	140-HxCB	C139				
52712-04-6	141-HxCB	U	ND	pg/L	2.09	21.1
41411-61-4	142-HxCB	U	ND	pg/L	2.28	21.1
68194-15-0	143-HxCB	U	ND	pg/L	2.20	21.1
68194-14-9	144-HxCB	U	ND	pg/L	1.25	21.1
74472-40-5	145-HxCB	U	ND	pg/L	0.993	21.1
51908-16-8	146-HxCB	U	ND	pg/L	1.67	21.1
68194-13-8	147-HxCB	CU	ND	pg/L	4.20	42.3
74472-41-6	148-HxCB	U	ND	pg/L	1.29	21.1
38380-04-0	149-HxCB	C147				
68194-08-1	150-HxCB	U	ND	pg/L	0.951	21.1
52663-63-5	151-HxCB	C135				
68194-09-2	152-HxCB	U	ND	pg/L	0.909	21.1
35065-27-1	153-HxCB	CJ	4.06	pg/L	1.54	42.3
60145-22-4	154-HxCB	U	ND	pg/L	1.10	21.1
33979-03-2	155-HxCB	U	ND	pg/L	0.951	21.1
38380-08-4	156-HxCB	CU	ND	pg/L	1.65	42.3
69782-90-7	157-HxCB	C156				
74472-42-7	158-HxCB	U	ND	pg/L	1.39	21.1
39635-35-3	159-HxCB	U	ND	pg/L	1.33	21.1
41411-62-5	160-HxCB	U	ND	pg/L	1.73	21.1

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458002	**Date Collected:**	09/28/2017 12:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-003K Rio Grande-North-20			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 11:55	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-5			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	946.6 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
74472-43-8	161-HxCB	U	ND	pg/L	1.54	21.1
39635-34-2	162-HxCB	U	ND	pg/L	1.35	21.1
74472-44-9	163-HxCB	C129				
74472-45-0	164-HxCB	U	ND	pg/L	1.50	21.1
74472-46-1	165-HxCB	U	ND	pg/L	1.65	21.1
41411-63-6	166-HxCB	C128				
52663-72-6	167-HxCB	U	ND	pg/L	1.27	21.1
59291-65-5	168-HxCB	C153				
32774-16-6	169-HxCB	U	ND	pg/L	1.48	21.1
35065-30-6	170-HpCB	U	ND	pg/L	2.20	21.1
52663-71-5	171-HpCB	CU	ND	pg/L	2.16	42.3
52663-74-8	172-HpCB	U	ND	pg/L	2.16	21.1
68194-16-1	173-HpCB	C171				
38411-25-5	174-HpCB	U	ND	pg/L	2.28	21.1
40186-70-7	175-HpCB	U	ND	pg/L	1.42	21.1
52663-65-7	176-HpCB	U	ND	pg/L	1.12	21.1
52663-70-4	177-HpCB	U	ND	pg/L	2.07	21.1
52663-67-9	178-HpCB	U	ND	pg/L	1.50	21.1
52663-64-6	179-HpCB	U	ND	pg/L	1.08	21.1
35065-29-3	180-HpCB	CJ	3.74	pg/L	1.75	42.3
74472-47-2	181-HpCB	U	ND	pg/L	1.99	21.1
60145-23-5	182-HpCB	U	ND	pg/L	1.39	21.1
52663-69-1	183-HpCB	CU	ND	pg/L	1.99	42.3
74472-48-3	184-HpCB	U	ND	pg/L	1.10	21.1
52712-05-7	185-HpCB	C183				
74472-49-4	186-HpCB	U	ND	pg/L	1.16	21.1
52663-68-0	187-HpCB	J	1.99	pg/L	1.37	21.1
74487-85-7	188-HpCB	U	ND	pg/L	1.12	21.1
39635-31-9	189-HpCB	U	ND	pg/L	1.42	21.1
41411-64-7	190-HpCB	U	ND	pg/L	1.65	21.1
74472-50-7	191-HpCB	U	ND	pg/L	1.54	21.1
74472-51-8	192-HpCB	U	ND	pg/L	1.77	21.1

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458002	**Date Collected:**	09/28/2017 12:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-003K Rio Grande-North-20			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 11:55	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-5			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	946.6 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
69782-91-8	193-HpCB	C180				
35694-08-7	194-OcCB	J	2.89	pg/L	1.50	21.1
52663-78-2	195-OcCB	U	ND	pg/L	1.58	21.1
42740-50-1	196-OcCB	U	ND	pg/L	1.39	21.1
33091-17-7	197-OcCB	CU	ND	pg/L	1.08	42.3
68194-17-2	198-OcCB	CJ	2.30	pg/L	1.46	42.3
52663-75-9	199-OcCB	C198				
52663-73-7	200-OcCB	C197				
40186-71-8	201-OcCB	U	ND	pg/L	1.06	21.1
2136-99-4	202-OcCB	U	ND	pg/L	1.16	21.1
52663-76-0	203-OcCB	U	ND	pg/L	1.33	21.1
74472-52-9	204-OcCB	U	ND	pg/L	1.06	21.1
74472-53-0	205-OcCB	U	ND	pg/L	1.18	21.1
40186-72-9	206-NoCB	U	ND	pg/L	1.84	21.1
52663-79-3	207-NoCB	U	ND	pg/L	1.44	21.1
52663-77-1	208-NoCB	U	ND	pg/L	1.33	21.1
2051-24-3	209-DeCB	J	1.96	pg/L	1.31	21.1
1336-36-3	Total PCB Congeners	J	210	pg/L	7.06	21.1

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		1030	2110	pg/L	48.8	(5%-145%)
13C-3-MoCB		1190	2110	pg/L	56.3	(5%-145%)
13C-4-DiCB		1350	2110	pg/L	64.0	(5%-145%)
13C-15-DiCB		2320	2110	pg/L	110	(5%-145%)
13C-19-TrCB		1930	2110	pg/L	91.3	(5%-145%)
13C-37-TrCB		1880	2110	pg/L	89.1	(5%-145%)
13C-54-TeCB		1390	2110	pg/L	66.0	(5%-145%)
13C-77-TeCB		1930	2110	pg/L	91.2	(10%-145%)
13C-81-TeCB		1920	2110	pg/L	91.0	(10%-145%)
13C-104-PeCB		1700	2110	pg/L	80.4	(10%-145%)
13C-105-PeCB		1740	2110	pg/L	82.4	(10%-145%)
13C-114-PeCB		1690	2110	pg/L	79.8	(10%-145%)
13C-118-PeCB		1690	2110	pg/L	80.2	(10%-145%)
13C-123-PeCB		1770	2110	pg/L	83.9	(10%-145%)
13C-126-PeCB		1730	2110	pg/L	82.1	(10%-145%)
13C-155-HxCB		1660	2110	pg/L	78.6	(10%-145%)
13C-156-HxCB	C	3210	4230	pg/L	76.0	(10%-145%)
13C-157-HxCB	C156L					
13C-167-HxCB		1670	2110	pg/L	79.1	(10%-145%)
13C-169-HxCB		1690	2110	pg/L	80.2	(10%-145%)
13C-188-HpCB		1610	2110	pg/L	76.2	(10%-145%)
13C-189-HpCB		1530	2110	pg/L	72.2	(10%-145%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	11458002	**Date Collected:**	09/28/2017 12:00	**Matrix:**	WATER
Client Sample:	1668C Water	**Date Received:**	10/06/2017 09:46		
Client ID:	1709F81-003K Rio Grande-North-20			**Prep Basis:**	As Received
Batch ID:	36029-	**Method:**	EPA Method 1668C		
Run Date:	10/21/2017 11:55	**Analyst:**	MJC	**Instrument:**	HRP875
Data File:	d21oct17a-5			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	946.6 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		1570	2110	pg/L	74.2	(10%-145%)
13C-205-OcCB		1930	2110	pg/L	91.3	(10%-145%)
13C-206-NoCB		2090	2110	pg/L	99.0	(10%-145%)
13C-208-NoCB		1770	2110	pg/L	83.6	(10%-145%)
13C-209-DeCB		2020	2110	pg/L	95.6	(10%-145%)
13C-28-TrCB		1340	2110	pg/L	63.3	(5%-145%)
13C-111-PeCB		1810	2110	pg/L	85.6	(10%-145%)
13C-178-HpCB		1840	2110	pg/L	87.0	(10%-145%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

J Value is estimated

U Analyte was analyzed for, but not detected above the specified detection limit.

Quality Control Summary

PCB Congeners
Surrogate Recovery Report

SDG Number: 1709F81

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
11458001	1709F81-001K Rio Grande-South-21070928	13C-1-MoCB		57.8	(5%-145%)
		13C-3-MoCB		66.6	(5%-145%)
		13C-4-DiCB		72.4	(5%-145%)
		13C-15-DiCB		141	(5%-145%)
		13C-19-TrCB		108	(5%-145%)
		13C-37-TrCB		101	(5%-145%)
		13C-54-TeCB		62.2	(5%-145%)
		13C-77-TeCB		104	(10%-145%)
		13C-81-TeCB		103	(10%-145%)
		13C-104-PeCB		81.6	(10%-145%)
		13C-105-PeCB		85.5	(10%-145%)
		13C-114-PeCB		82.4	(10%-145%)
		13C-118-PeCB		81.7	(10%-145%)
		13C-123-PeCB		85.7	(10%-145%)
		13C-126-PeCB		87.1	(10%-145%)
		13C-155-HxCB		81.9	(10%-145%)
		13C-156-HxCB	C	79.9	(10%-145%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		83.3	(10%-145%)
		13C-169-HxCB		88.3	(10%-145%)
		13C-188-HpCB		76.4	(10%-145%)
		13C-189-HpCB		77.0	(10%-145%)
		13C-202-OcCB		74.2	(10%-145%)
		13C-205-OcCB		97.3	(10%-145%)
		13C-206-NoCB		105	(10%-145%)
		13C-208-NoCB		89.9	(10%-145%)
		13C-209-DeCB		102	(10%-145%)
		13C-28-TrCB		57.4	(5%-145%)
		13C-111-PeCB		88.9	(10%-145%)
		13C-178-HpCB		91.1	(10%-145%)
11458002	1709F81-003K Rio Grande-North-20170927	13C-1-MoCB		48.8	(5%-145%)
		13C-3-MoCB		56.3	(5%-145%)
		13C-4-DiCB		64.0	(5%-145%)
		13C-15-DiCB		110	(5%-145%)
		13C-19-TrCB		91.3	(5%-145%)
		13C-37-TrCB		89.1	(5%-145%)
		13C-54-TeCB		66.0	(5%-145%)
		13C-77-TeCB		91.2	(10%-145%)
		13C-81-TeCB		91.0	(10%-145%)
		13C-104-PeCB		80.4	(10%-145%)
		13C-105-PeCB		82.4	(10%-145%)
		13C-114-PeCB		79.8	(10%-145%)
		13C-118-PeCB		80.2	(10%-145%)
		13C-123-PeCB		83.9	(10%-145%)
		13C-126-PeCB		82.1	(10%-145%)
		13C-155-HxCB		78.6	(10%-145%)
		13C-156-HxCB	C	76.0	(10%-145%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		79.1	(10%-145%)
		13C-169-HxCB		80.2	(10%-145%)
		13C-188-HpCB		76.2	(10%-145%)
		13C-189-HpCB		72.2	(10%-145%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1709F81

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
11458002	1709F81-003K Rio Grande-North-20170927	13C-202-OcCB		74.2	(10%-145%)
		13C-205-OcCB		91.3	(10%-145%)
		13C-206-NoCB		99.0	(10%-145%)
		13C-208-NoCB		83.6	(10%-145%)
		13C-209-DeCB		95.6	(10%-145%)
		13C-28-TrCB		63.3	(5%-145%)
		13C-111-PeCB		85.6	(10%-145%)
		13C-178-HpCB		87.0	(10%-145%)
12019814	LCS for batch 35954	13C-1-MoCB		47.4	(15%-145%)
		13C-3-MoCB		57.8	(15%-145%)
		13C-4-DiCB		66.6	(15%-145%)
		13C-15-DiCB		104	(15%-145%)
		13C-19-TrCB		91.0	(15%-145%)
		13C-37-TrCB		103	(15%-145%)
		13C-54-TeCB		64.0	(15%-145%)
		13C-77-TeCB		120	(40%-145%)
		13C-81-TeCB		119	(40%-145%)
		13C-104-PeCB		81.3	(40%-145%)
		13C-105-PeCB		86.9	(40%-145%)
		13C-114-PeCB		84.9	(40%-145%)
		13C-118-PeCB		84.3	(40%-145%)
		13C-123-PeCB		89.1	(40%-145%)
		13C-126-PeCB		87.7	(40%-145%)
		13C-155-HxCB		82.9	(40%-145%)
		13C-156-HxCB	C	82.8	(40%-145%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		86.0	(40%-145%)
		13C-169-HxCB		90.6	(40%-145%)
		13C-188-HpCB		78.8	(40%-145%)
		13C-189-HpCB		78.5	(40%-145%)
		13C-202-OcCB		79.8	(40%-145%)
		13C-205-OcCB		100	(40%-145%)
		13C-206-NoCB		115	(40%-145%)
		13C-208-NoCB		96.2	(40%-145%)
		13C-209-DeCB		113	(40%-145%)
		13C-28-TrCB		59.9	(15%-145%)
		13C-111-PeCB		94.9	(40%-145%)
		13C-178-HpCB		100	(40%-145%)
12019815	LCSD for batch 35954	13C-1-MoCB		46.1	(15%-145%)
		13C-3-MoCB		53.2	(15%-145%)
		13C-4-DiCB		64.3	(15%-145%)
		13C-15-DiCB		97.5	(15%-145%)
		13C-19-TrCB		88.7	(15%-145%)
		13C-37-TrCB		99.2	(15%-145%)
		13C-54-TeCB		67.1	(15%-145%)
		13C-77-TeCB		120	(40%-145%)
		13C-81-TeCB		119	(40%-145%)
		13C-104-PeCB		77.7	(40%-145%)
		13C-105-PeCB		86.4	(40%-145%)
		13C-114-PeCB		83.7	(40%-145%)
		13C-118-PeCB		84.5	(40%-145%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1709F81

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12019815	LCSD for batch 35954	13C-123-PeCB		86.7	(40%-145%)
		13C-126-PeCB		89.4	(40%-145%)
		13C-155-HxCB		78.0	(40%-145%)
		13C-156-HxCB	C	78.8	(40%-145%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		81.1	(40%-145%)
		13C-169-HxCB		88.1	(40%-145%)
		13C-188-HpCB		73.5	(40%-145%)
		13C-189-HpCB		74.6	(40%-145%)
		13C-202-OcCB		74.0	(40%-145%)
		13C-205-OcCB		97.9	(40%-145%)
		13C-206-NoCB		111	(40%-145%)
		13C-208-NoCB		91.6	(40%-145%)
		13C-209-DeCB		110	(40%-145%)
		13C-28-TrCB		63.3	(15%-145%)
		13C-111-PeCB		92.0	(40%-145%)
		13C-178-HpCB		95.7	(40%-145%)
12019813	MB for batch 35954	13C-1-MoCB		52.1	(5%-145%)
		13C-3-MoCB		57.8	(5%-145%)
		13C-4-DiCB		68.8	(5%-145%)
		13C-15-DiCB		113	(5%-145%)
		13C-19-TrCB		95.5	(5%-145%)
		13C-37-TrCB		106	(5%-145%)
		13C-54-TeCB		67.5	(5%-145%)
		13C-77-TeCB		125	(10%-145%)
		13C-81-TeCB		127	(10%-145%)
		13C-104-PeCB		78.2	(10%-145%)
		13C-105-PeCB		87.3	(10%-145%)
		13C-114-PeCB		84.8	(10%-145%)
		13C-118-PeCB		84.5	(10%-145%)
		13C-123-PeCB		88.7	(10%-145%)
		13C-126-PeCB		89.2	(10%-145%)
		13C-155-HxCB		82.0	(10%-145%)
		13C-156-HxCB	C	80.0	(10%-145%)
		13C-157-HxCB	C156L		
		13C-167-HxCB		82.2	(10%-145%)
		13C-169-HxCB		89.5	(10%-145%)
		13C-188-HpCB		75.4	(10%-145%)
		13C-189-HpCB		75.7	(10%-145%)
		13C-202-OcCB		75.9	(10%-145%)
		13C-205-OcCB		97.6	(10%-145%)
		13C-206-NoCB		111	(10%-145%)
		13C-208-NoCB		93.4	(10%-145%)
		13C-209-DeCB		112	(10%-145%)
		13C-28-TrCB		61.5	(5%-145%)
		13C-111-PeCB		96.5	(10%-145%)
		13C-178-HpCB		98.0	(10%-145%)

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

PCB Congeners
Quality Control Summary
Spike Recovery Report

SDG Number: 1709F81 **Sample Type:** Laboratory Control Sample
Client ID: LCS for batch 35954 **Matrix:** WATER
Lab Sample ID: 12019814
Instrument: HRP875 **Analysis Date:** 10/23/2017 09:59 **Dilution:** 1
Analyst: MLS **Prep Batch ID:** 35954
Batch ID: 36029

CAS No.		Parmname	Amount Added pg/L		Spike Conc. pg/L	Recovery %	Acceptance Limits
2051-60-7	LCS	1-MoCB	500		464	92.7	60-135
2051-62-9	LCS	3-MoCB	500		495	99	60-135
13029-08-8	LCS	4-DiCB	500		470	93.9	60-135
2050-68-2	LCS	15-DiCB	500		559	112	60-135
38444-73-4	LCS	19-TrCB	500		489	97.7	60-135
38444-90-5	LCS	37-TrCB	500		499	99.9	60-135
15968-05-5	LCS	54-TeCB	1000		957	95.7	60-135
32598-13-3	LCS	77-TeCB	1000		927	92.7	60-135
70362-50-4	LCS	81-TeCB	1000		1030	103	60-135
56558-16-8	LCS	104-PeCB	1000		1010	101	60-135
32598-14-4	LCS	105-PeCB	1000		1130	113	60-135
74472-37-0	LCS	114-PeCB	1000		1020	102	60-135
31508-00-6	LCS	118-PeCB	1000		1000	100	60-135
65510-44-3	LCS	123-PeCB	1000		993	99.3	60-135
57465-28-8	LCS	126-PeCB	1000		1110	111	60-135
33979-03-2	LCS	155-HxCB	1000		1150	115	60-135
38380-08-4	LCS	156-HxCB	2000	C	2260	113	60-135
69782-90-7	LCS	157-HxCB		C156			
52663-72-6	LCS	167-HxCB	1000		1140	114	60-135
32774-16-6	LCS	169-HxCB	1000		1080	108	60-135
74487-85-7	LCS	188-HpCB	1000		1000	100	60-135
39635-31-9	LCS	189-HpCB	1000		1040	104	60-135
2136-99-4	LCS	202-OcCB	1500		1510	100	60-135
74472-53-0	LCS	205-OcCB	1500		1410	94.3	60-135
40186-72-9	LCS	206-NoCB	1500		1390	92.4	60-135
52663-77-1	LCS	208-NoCB	1500		1520	101	60-135
2051-24-3	LCS	209-DcCB	1500		1580	105	60-135

PCB Congeners
Quality Control Summary
Spike Recovery Report

SDG Number: 1709F81
Client ID: LCSD for batch 35954
Lab Sample ID: 12019815
Instrument: HRP875
Analyst: MLS

Sample Type: Laboratory Control Sample Duplicate
Matrix: WATER
Analysis Date: 10/23/2017 11:08
Dilution: 1
Prep Batch ID: 35954
Batch ID: 36029

CAS No.		Parmname	Amount Added pg/L		Spike Conc. pg/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
2051-60-7	LCSD	1-MoCB	500		445	89	60-135	4.11	0-30
2051-62-9	LCSD	3-MoCB	500		517	103	60-135	4.22	0-30
13029-08-8	LCSD	4-DiCB	500		471	94.2	60-135	0.332	0-30
2050-68-2	LCSD	15-DiCB	500		548	110	60-135	1.98	0-30
38444-73-4	LCSD	19-TrCB	500		486	97.2	60-135	0.505	0-30
38444-90-5	LCSD	37-TrCB	500		496	99.2	60-135	0.683	0-30
15968-05-5	LCSD	54-TeCB	1000		956	95.6	60-135	0.128	0-30
32598-13-3	LCSD	77-TeCB	1000		908	90.8	60-135	2.08	0-30
70362-50-4	LCSD	81-TeCB	1000		1010	101	60-135	1.59	0-30
56558-16-8	LCSD	104-PeCB	1000		987	98.7	60-135	1.94	0-30
32598-14-4	LCSD	105-PeCB	1000		1100	110	60-135	3.21	0-30
74472-37-0	LCSD	114-PeCB	1000		998	99.8	60-135	2.23	0-30
31508-00-6	LCSD	118-PeCB	1000		964	96.4	60-135	3.71	0-30
65510-44-3	LCSD	123-PeCB	1000		970	97	60-135	2.27	0-30
57465-28-8	LCSD	126-PeCB	1000		1070	107	60-135	3.21	0-30
33979-03-2	LCSD	155-HxCB	1000		1090	109	60-135	5.84	0-30
38380-08-4	LCSD	156-HxCB	2000	C	2180	109	60-135	3.67	0-30
69782-90-7	LCSD	157-HxCB		C156					
52663-72-6	LCSD	167-HxCB	1000		1120	112	60-135	1.94	0-30
32774-16-6	LCSD	169-HxCB	1000		1060	106	60-135	1.87	0-30
74487-85-7	LCSD	188-HpCB	1000		982	98.2	60-135	1.77	0-30
39635-31-9	LCSD	189-HpCB	1000		1030	103	60-135	0.740	0-30
2136-99-4	LCSD	202-OcCB	1500		1480	98.7	60-135	1.69	0-30
74472-53-0	LCSD	205-OcCB	1500		1380	91.8	60-135	2.66	0-30
40186-72-9	LCSD	206-NoCB	1500		1360	90.9	60-135	1.62	0-30
52663-77-1	LCSD	208-NoCB	1500		1510	101	60-135	0.398	0-30
2051-24-3	LCSD	209-DeCB	1500		1550	103	60-135	1.65	0-30

Method Blank Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Matrix:**	**WATER**
Client ID:	**MB for batch 35954**	**Instrument ID:**	**HRP875**	**Data File:**	**d23oct17a-4**
Lab Sample ID:	**12019813**	**Prep Date:**	**17-OCT-17**	**Analyzed:**	**10/23/17 12:18**
Column:					

This method blank applies to the following samples and quality control samples:

	Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01	1709F81-001K Rio Grande-South-21070928	11458001	d21oct17a-4	10/21/17	1046
02	1709F81-003K Rio Grande-North-20170927	11458002	d21oct17a-5	10/21/17	1155
03	LCS for batch 35954	12019814	d23oct17a-2	10/23/17	0959
04	LCSD for batch 35954	12019815	d23oct17a-3	10/23/17	1108

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**12019813**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35954**				
Client ID:	**MB for batch 35954**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/23/2017 12:18**	**Analyst:**	**MLS**	**Instrument:**	**HRP875**
Data File:	**d23oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB	U	ND	pg/L	2.44	20.0
2051-61-8	2-MoCB	U	ND	pg/L	2.82	20.0
2051-62-9	3-MoCB	U	ND	pg/L	2.72	20.0
13029-08-8	4-DiCB	U	ND	pg/L	11.5	20.0
16605-91-7	5-DiCB	U	ND	pg/L	11.5	20.0
25569-80-6	6-DiCB	U	ND	pg/L	9.38	20.0
33284-50-3	7-DiCB	U	ND	pg/L	9.82	20.0
34883-43-7	8-DiCB	U	ND	pg/L	8.54	20.0
34883-39-1	9-DiCB	U	ND	pg/L	10.6	20.0
33146-45-1	10-DiCB	U	ND	pg/L	7.22	20.0
2050-67-1	11-DiCB	U	ND	pg/L	10.5	100
2974-92-7	12-DiCB	CU	ND	pg/L	10.4	40.0
2974-90-5	13-DiCB	C12				
34883-41-5	14-DiCB	U	ND	pg/L	9.84	20.0
2050-68-2	15-DiCB	U	ND	pg/L	10.8	20.0
38444-78-9	16-TrCB	U	ND	pg/L	2.86	20.0
37680-66-3	17-TrCB	U	ND	pg/L	2.78	20.0
37680-65-2	18-TrCB	CU	ND	pg/L	2.26	40.0
38444-73-4	19-TrCB	U	ND	pg/L	4.30	20.0
38444-84-7	20-TrCB	CJ	2.48	pg/L	1.86	40.0
55702-46-0	21-TrCB	CU	ND	pg/L	1.84	40.0
38444-85-8	22-TrCB	U	ND	pg/L	1.92	20.0
55720-44-0	23-TrCB	U	ND	pg/L	1.92	20.0
55702-45-9	24-TrCB	U	ND	pg/L	1.98	20.0
55712-37-3	25-TrCB	U	ND	pg/L	1.66	20.0
38444-81-4	26-TrCB	CU	ND	pg/L	1.86	40.0
38444-76-7	27-TrCB	U	ND	pg/L	1.98	20.0
7012-37-5	28-TrCB	C20				
15862-07-4	29-TrCB	C26				
35693-92-6	30-TrCB	C18				
16606-02-3	31-TrCB	U	ND	pg/L	2.34	20.0
38444-77-8	32-TrCB	U	ND	pg/L	1.76	20.0

Comments:
C Congener has coeluters. When Cxxx, refer to congener number xxx for data
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U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	12019813			**Matrix:**	WATER
Client Sample:	QC for batch 35954				
Client ID:	MB for batch 35954			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/23/2017 12:18	**Analyst:**	MLS	**Instrument:**	HRP875
Data File:	d23oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	1000 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
38444-86-9	33-TrCB	C21				
37680-68-5	34-TrCB	U	ND	pg/L	1.96	20.0
37680-69-6	35-TrCB	U	ND	pg/L	2.42	20.0
38444-87-0	36-TrCB	U	ND	pg/L	2.10	20.0
38444-90-5	37-TrCB	U	ND	pg/L	2.12	20.0
53555-66-1	38-TrCB	U	ND	pg/L	2.24	20.0
38444-88-1	39-TrCB	U	ND	pg/L	2.10	20.0
38444-93-8	40-TeCB	CU	ND	pg/L	2.88	40.0
52663-59-9	41-TeCB	U	ND	pg/L	3.22	20.0
36559-22-5	42-TeCB	U	ND	pg/L	3.22	20.0
70362-46-8	43-TeCB	U	ND	pg/L	3.88	20.0
41464-39-5	44-TeCB	CJ	4.44	pg/L	2.84	60.0
70362-45-7	45-TeCB	CU	ND	pg/L	1.40	40.0
41464-47-5	46-TeCB	U	ND	pg/L	1.42	20.0
2437-79-8	47-TeCB	C44				
70362-47-9	48-TeCB	U	ND	pg/L	3.02	20.0
41464-40-8	49-TeCB	CU	ND	pg/L	2.60	40.0
62796-65-0	50-TeCB	CU	ND	pg/L	1.30	40.0
68194-04-7	51-TeCB	C45				
35693-99-3	52-TeCB	J	3.06	pg/L	2.78	20.0
41464-41-9	53-TeCB	C50				
15968-05-5	54-TeCB	U	ND	pg/L	1.56	20.0
74338-24-2	55-TeCB	U	ND	pg/L	2.30	20.0
41464-43-1	56-TeCB	U	ND	pg/L	2.28	20.0
70424-67-8	57-TeCB	U	ND	pg/L	2.08	20.0
41464-49-7	58-TeCB	U	ND	pg/L	2.06	20.0
74472-33-6	59-TeCB	CU	ND	pg/L	2.26	60.0
33025-41-1	60-TeCB	U	ND	pg/L	2.20	20.0
33284-53-6	61-TeCB	CJ	4.76	pg/L	2.06	80.0
54230-22-7	62-TeCB	C59				
74472-34-7	63-TeCB	U	ND	pg/L	1.94	20.0
52663-58-8	64-TeCB	U	ND	pg/L	2.24	20.0

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	12019813			**Matrix:**	WATER
Client Sample:	QC for batch 35954				
Client ID:	MB for batch 35954			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/23/2017 12:18	**Analyst:**	MLS	**Instrument:**	HRP875
Data File:	d23oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	1000 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
33284-54-7	65-TeCB	C44				
32598-10-0	66-TeCB	U	ND	pg/L	1.92	20.0
73575-53-8	67-TeCB	U	ND	pg/L	1.88	20.0
73575-52-7	68-TeCB	U	ND	pg/L	1.92	20.0
60233-24-1	69-TeCB	C49				
32598-11-1	70-TeCB	C61				
41464-46-4	71-TeCB	C40				
41464-42-0	72-TeCB	U	ND	pg/L	1.96	20.0
74338-23-1	73-TeCB	U	ND	pg/L	2.32	20.0
32690-93-0	74-TeCB	C61				
32598-12-2	75-TeCB	C59				
70362-48-0	76-TeCB	C61				
32598-13-3	77-TeCB	J	2.36	pg/L	1.82	20.0
70362-49-1	78-TeCB	U	ND	pg/L	2.16	20.0
41464-48-6	79-TeCB	U	ND	pg/L	1.90	20.0
33284-52-5	80-TeCB	U	ND	pg/L	1.88	20.0
70362-50-4	81-TeCB	U	ND	pg/L	1.76	20.0
52663-62-4	82-PeCB	U	ND	pg/L	2.18	20.0
60145-20-2	83-PeCB	U	ND	pg/L	2.16	20.0
52663-60-2	84-PeCB	U	ND	pg/L	2.14	20.0
65510-45-4	85-PeCB	CU	ND	pg/L	1.62	60.0
55312-69-1	86-PeCB	CU	ND	pg/L	3.76	120
38380-02-8	87-PeCB	C86				
55215-17-3	88-PeCB	CU	ND	pg/L	1.96	40.0
73575-57-2	89-PeCB	U	ND	pg/L	2.00	20.0
68194-07-0	90-PeCB	CJ	2.78	pg/L	1.70	60.0
68194-05-8	91-PeCB	C88				
52663-61-3	92-PeCB	U	ND	pg/L	1.96	20.0
73575-56-1	93-PeCB	CU	ND	pg/L	1.88	40.0
73575-55-0	94-PeCB	U	ND	pg/L	2.10	20.0
38379-99-6	95-PeCB	U	ND	pg/L	1.90	20.0
73575-54-9	96-PeCB	U	ND	pg/L	0.720	20.0

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**12019813**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35954**				
Client ID:	**MB for batch 35954**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/23/2017 12:18**	**Analyst:**	**MLS**	**Instrument:**	**HRP875**
Data File:	**d23oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
41464-51-1	97-PeCB	C86				
60233-25-2	98-PeCB	CU	ND	pg/L	2.00	40.0
38380-01-7	99-PeCB	U	ND	pg/L	1.66	20.0
39485-83-1	100-PeCB	C93				
37680-73-2	101-PeCB	C90				
68194-06-9	102-PeCB	C98				
60145-21-3	103-PeCB	U	ND	pg/L	1.76	20.0
56558-16-8	104-PeCB	U	ND	pg/L	0.800	20.0
32598-14-4	105-PeCB	U	ND	pg/L	1.80	20.0
70424-69-0	106-PeCB	U	ND	pg/L	1.88	20.0
70424-68-9	107-PeCB	U	ND	pg/L	1.52	20.0
70362-41-3	108-PeCB	CU	ND	pg/L	1.74	40.0
74472-35-8	109-PeCB	C86				
38380-03-9	110-PeCB	CJ	1.76	pg/L	1.54	40.0
39635-32-0	111-PeCB	U	ND	pg/L	1.44	20.0
74472-36-9	112-PeCB	U	ND	pg/L	1.62	20.0
68194-10-5	113-PeCB	C90				
74472-37-0	114-PeCB	U	ND	pg/L	1.76	20.0
74472-38-1	115-PeCB	C110				
18259-05-7	116-PeCB	C85				
68194-11-6	117-PeCB	C85				
31508-00-6	118-PeCB	U	ND	pg/L	1.68	20.0
56558-17-9	119-PeCB	C86				
68194-12-7	120-PeCB	U	ND	pg/L	1.40	20.0
56558-18-0	121-PeCB	U	ND	pg/L	1.48	20.0
76842-07-4	122-PeCB	U	ND	pg/L	1.82	20.0
65510-44-3	123-PeCB	U	ND	pg/L	1.66	20.0
70424-70-3	124-PeCB	C108				
74472-39-2	125-PeCB	C86				
57465-28-8	126-PeCB	U	ND	pg/L	1.96	20.0
39635-33-1	127-PeCB	U	ND	pg/L	1.74	20.0
38380-07-3	128-HxCB	CU	ND	pg/L	1.92	40.0

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	12019813			**Matrix:**	WATER
Client Sample:	QC for batch 35954				
Client ID:	MB for batch 35954			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/23/2017 12:18	**Analyst:**	MLS	**Instrument:**	HRP875
Data File:	d23oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	1000 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
55215-18-4	129-HxCB	CJ	2.58	pg/L	2.00	60.0
52663-66-8	130-HxCB	U	ND	pg/L	2.40	20.0
61798-70-7	131-HxCB	U	ND	pg/L	2.58	20.0
38380-05-1	132-HxCB	U	ND	pg/L	2.42	20.0
35694-04-3	133-HxCB	U	ND	pg/L	2.26	20.0
52704-70-8	134-HxCB	U	ND	pg/L	2.62	20.0
52744-13-5	135-HxCB	CU	ND	pg/L	1.08	40.0
38411-22-2	136-HxCB	U	ND	pg/L	0.800	20.0
35694-06-5	137-HxCB	U	ND	pg/L	2.02	20.0
35065-28-2	138-HxCB	C129				
56030-56-9	139-HxCB	CU	ND	pg/L	2.08	40.0
59291-64-4	140-HxCB	C139				
52712-04-6	141-HxCB	U	ND	pg/L	2.26	20.0
41411-61-4	142-HxCB	U	ND	pg/L	2.56	20.0
68194-15-0	143-HxCB	U	ND	pg/L	2.44	20.0
68194-14-9	144-HxCB	U	ND	pg/L	1.02	20.0
74472-40-5	145-HxCB	U	ND	pg/L	0.840	20.0
51908-16-8	146-HxCB	U	ND	pg/L	1.76	20.0
68194-13-8	147-HxCB	CU	ND	pg/L	2.14	40.0
74472-41-6	148-HxCB	U	ND	pg/L	1.06	20.0
38380-04-0	149-HxCB	C147				
68194-08-1	150-HxCB	U	ND	pg/L	0.820	20.0
52663-63-5	151-HxCB	C135				
68194-09-2	152-HxCB	U	ND	pg/L	0.800	20.0
35065-27-1	153-HxCB	CU	ND	pg/L	1.70	40.0
60145-22-4	154-HxCB	U	ND	pg/L	0.920	20.0
33979-03-2	155-HxCB	U	ND	pg/L	0.760	20.0
38380-08-4	156-HxCB	CJ	2.20	pg/L	1.34	40.0
69782-90-7	157-HxCB	C156				
74472-42-7	158-HxCB	U	ND	pg/L	1.52	20.0
39635-35-3	159-HxCB	U	ND	pg/L	1.06	20.0
41411-62-5	160-HxCB	U	ND	pg/L	1.92	20.0

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**12019813**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35954**				
Client ID:	**MB for batch 35954**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/23/2017 12:18**	**Analyst:**	**MLS**	**Instrument:**	**HRP875**
Data File:	**d23oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
74472-43-8	161-HxCB	U	ND	pg/L	1.72	20.0
39635-34-2	162-HxCB	U	ND	pg/L	1.06	20.0
74472-44-9	163-HxCB	C129				
74472-45-0	164-HxCB	U	ND	pg/L	1.74	20.0
74472-46-1	165-HxCB	U	ND	pg/L	1.84	20.0
41411-63-6	166-HxCB	C128				
52663-72-6	167-HxCB	U	ND	pg/L	1.02	20.0
59291-65-5	168-HxCB	C153				
32774-16-6	169-HxCB	U	ND	pg/L	1.12	20.0
35065-30-6	170-HpCB	U	ND	pg/L	1.42	20.0
52663-71-5	171-HpCB	CU	ND	pg/L	1.46	40.0
52663-74-8	172-HpCB	U	ND	pg/L	1.44	20.0
68194-16-1	173-HpCB	C171				
38411-25-5	174-HpCB	U	ND	pg/L	1.42	20.0
40186-70-7	175-HpCB	U	ND	pg/L	1.28	20.0
52663-65-7	176-HpCB	U	ND	pg/L	1.00	20.0
52663-70-4	177-HpCB	U	ND	pg/L	1.44	20.0
52663-67-9	178-HpCB	U	ND	pg/L	1.34	20.0
52663-64-6	179-HpCB	U	ND	pg/L	1.00	20.0
35065-29-3	180-HpCB	CU	ND	pg/L	1.16	40.0
74472-47-2	181-HpCB	U	ND	pg/L	1.38	20.0
60145-23-5	182-HpCB	U	ND	pg/L	1.24	20.0
52663-69-1	183-HpCB	CU	ND	pg/L	1.34	40.0
74472-48-3	184-HpCB	U	ND	pg/L	0.960	20.0
52712-05-7	185-HpCB	C183				
74472-49-4	186-HpCB	U	ND	pg/L	1.04	20.0
52663-68-0	187-HpCB	U	ND	pg/L	1.22	20.0
74487-85-7	188-HpCB	U	ND	pg/L	1.02	20.0
39635-31-9	189-HpCB	U	ND	pg/L	1.22	20.0
41411-64-7	190-HpCB	U	ND	pg/L	1.08	20.0
74472-50-7	191-HpCB	U	ND	pg/L	1.06	20.0
74472-51-8	192-HpCB	U	ND	pg/L	1.18	20.0

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**12019813**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35954**				
Client ID:	**MB for batch 35954**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/23/2017 12:18**	**Analyst:**	**MLS**	**Instrument:**	**HRP875**
Data File:	**d23oct17a-4**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
69782-91-8	193-HpCB	C180				
35694-08-7	194-OcCB	U	ND	pg/L	1.38	20.0
52663-78-2	195-OcCB	U	ND	pg/L	1.32	20.0
42740-50-1	196-OcCB	U	ND	pg/L	1.16	20.0
33091-17-7	197-OcCB	CU	ND	pg/L	0.920	40.0
68194-17-2	198-OcCB	CU	ND	pg/L	1.22	40.0
52663-75-9	199-OcCB	C198				
52663-73-7	200-OcCB	C197				
40186-71-8	201-OcCB	U	ND	pg/L	0.900	20.0
2136-99-4	202-OcCB	U	ND	pg/L	0.980	20.0
52663-76-0	203-OcCB	U	ND	pg/L	1.16	20.0
74472-52-9	204-OcCB	U	ND	pg/L	0.900	20.0
74472-53-0	205-OcCB	U	ND	pg/L	0.980	20.0
40186-72-9	206-NoCB	U	ND	pg/L	1.30	20.0
52663-79-3	207-NoCB	U	ND	pg/L	0.980	20.0
52663-77-1	208-NoCB	U	ND	pg/L	0.920	20.0
2051-24-3	209-DeCB	J	1.66	pg/L	0.960	20.0
1336-36-3	Total PCB Congeners	J	28.1	pg/L	6.68	20.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		1040	2000	pg/L	52.1	(5%-145%)
13C-3-MoCB		1160	2000	pg/L	57.8	(5%-145%)
13C-4-DiCB		1380	2000	pg/L	68.8	(5%-145%)
13C-15-DiCB		2260	2000	pg/L	113	(5%-145%)
13C-19-TrCB		1910	2000	pg/L	95.5	(5%-145%)
13C-37-TrCB		2120	2000	pg/L	106	(5%-145%)
13C-54-TeCB		1350	2000	pg/L	67.5	(5%-145%)
13C-77-TeCB		2500	2000	pg/L	125	(10%-145%)
13C-81-TeCB		2530	2000	pg/L	127	(10%-145%)
13C-104-PeCB		1560	2000	pg/L	78.2	(10%-145%)
13C-105-PeCB		1750	2000	pg/L	87.3	(10%-145%)
13C-114-PeCB		1700	2000	pg/L	84.8	(10%-145%)
13C-118-PeCB		1690	2000	pg/L	84.5	(10%-145%)
13C-123-PeCB		1770	2000	pg/L	88.7	(10%-145%)
13C-126-PeCB		1780	2000	pg/L	89.2	(10%-145%)
13C-155-HxCB		1640	2000	pg/L	82.0	(10%-145%)
13C-156-HxCB	C	3200	4000	pg/L	80.0	(10%-145%)
13C-157-HxCB	C156L					
13C-167-HxCB		1640	2000	pg/L	82.2	(10%-145%)
13C-169-HxCB		1790	2000	pg/L	89.5	(10%-145%)
13C-188-HpCB		1510	2000	pg/L	75.4	(10%-145%)
13C-189-HpCB		1510	2000	pg/L	75.7	(10%-145%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	12019813			**Matrix:**	WATER
Client Sample:	QC for batch 35954				
Client ID:	MB for batch 35954			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/23/2017 12:18	**Analyst:**	MLS	**Instrument:**	HRP875
Data File:	d23oct17a-4			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	1000 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		1520	2000	pg/L	75.9	(10%-145%)
13C-205-OcCB		1950	2000	pg/L	97.6	(10%-145%)
13C-206-NoCB		2220	2000	pg/L	111	(10%-145%)
13C-208-NoCB		1870	2000	pg/L	93.4	(10%-145%)
13C-209-DcCB		2230	2000	pg/L	112	(10%-145%)
13C-28-TrCB		1230	2000	pg/L	61.5	(5%-145%)
13C-111-PeCB		1930	2000	pg/L	96.5	(10%-145%)
13C-178-HpCB		1960	2000	pg/L	98.0	(10%-145%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	12019814			**Matrix:**	WATER
Client Sample:	QC for batch 35954				
Client ID:	LCS for batch 35954			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/23/2017 09:59	**Analyst:**	MLS	**Instrument:**	HRP875
Data File:	d23oct17a-2			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	1000 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB		464	pg/L	5.28	20.0
2051-62-9	3-MoCB		495	pg/L	5.58	20.0
13029-08-8	4-DiCB		470	pg/L	14.2	20.0
2050-68-2	15-DiCB		559	pg/L	15.3	20.0
38444-73-4	19-TrCB		489	pg/L	6.64	20.0
38444-90-5	37-TrCB		499	pg/L	12.2	20.0
15968-05-5	54-TeCB		957	pg/L	2.48	20.0
32598-13-3	77-TeCB		927	pg/L	9.12	20.0
70362-50-4	81-TeCB		1030	pg/L	8.74	20.0
56558-16-8	104-PeCB		1010	pg/L	1.54	20.0
32598-14-4	105-PeCB		1130	pg/L	9.62	20.0
74472-37-0	114-PeCB		1020	pg/L	9.20	20.0
31508-00-6	118-PeCB		1000	pg/L	8.90	20.0
65510-44-3	123-PeCB		993	pg/L	8.78	20.0
57465-28-8	126-PeCB		1110	pg/L	10.7	20.0
33979-03-2	155-HxCB		1150	pg/L	1.16	20.0
38380-08-4	156-HxCB	C	2260	pg/L	7.66	40.0
69782-90-7	157-HxCB	C156				
52663-72-6	167-HxCB		1140	pg/L	5.82	20.0
32774-16-6	169-HxCB		1080	pg/L	6.60	20.0
74487-85-7	188-HpCB		1000	pg/L	2.02	20.0
39635-31-9	189-HpCB		1040	pg/L	2.86	20.0
2136-99-4	202-OcCB		1510	pg/L	1.64	20.0
74472-53-0	205-OcCB		1410	pg/L	2.98	20.0
40186-72-9	206-NoCB		1390	pg/L	2.12	20.0
52663-77-1	208-NoCB		1520	pg/L	1.52	20.0
2051-24-3	209-DeCB		1580	pg/L	1.18	20.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		947	2000	pg/L	47.4	(15%-145%)
13C-3-MoCB		1160	2000	pg/L	57.8	(15%-145%)
13C-4-DiCB		1330	2000	pg/L	66.6	(15%-145%)
13C-15-DiCB		2090	2000	pg/L	104	(15%-145%)
13C-19-TrCB		1820	2000	pg/L	91.0	(15%-145%)
13C-37-TrCB		2050	2000	pg/L	103	(15%-145%)
13C-54-TeCB		1280	2000	pg/L	64.0	(15%-145%)
13C-77-TeCB		2400	2000	pg/L	120	(40%-145%)
13C-81-TeCB		2390	2000	pg/L	119	(40%-145%)
13C-104-PeCB		1630	2000	pg/L	81.3	(40%-145%)
13C-105-PeCB		1740	2000	pg/L	86.9	(40%-145%)
13C-114-PeCB		1700	2000	pg/L	84.9	(40%-145%)
13C-118-PeCB		1690	2000	pg/L	84.3	(40%-145%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	1709F81	**Client:**	HALL001	**Project:**	HALL00117
Lab Sample ID:	12019814			**Matrix:**	WATER
Client Sample:	QC for batch 35954				
Client ID:	LCS for batch 35954			**Prep Basis:**	As Received
Batch ID:	36029	**Method:**	EPA Method 1668C		
Run Date:	10/23/2017 09:59	**Analyst:**	MLS	**Instrument:**	HRP875
Data File:	d23oct17a-2			**Dilution:**	1
Prep Batch:	35954	**Prep Method:**	SW846 3520C	**Prep SOP Ref:**	CF-OA-E-001
Prep Date:	17-OCT-17	**Prep Aliquot:**	1000 mL		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-123-PeCB		1780	2000	pg/L	89.1	(40%-145%)
13C-126-PeCB		1750	2000	pg/L	87.7	(40%-145%)
13C-155-HxCB		1660	2000	pg/L	82.9	(40%-145%)
13C-156-HxCB	C	3310	4000	pg/L	82.8	(40%-145%)
13C-157-HxCB	C156L					
13C-167-HxCB		1720	2000	pg/L	86.0	(40%-145%)
13C-169-HxCB		1810	2000	pg/L	90.6	(40%-145%)
13C-188-HpCB		1580	2000	pg/L	78.8	(40%-145%)
13C-189-HpCB		1570	2000	pg/L	78.5	(40%-145%)
13C-202-OcCB		1600	2000	pg/L	79.8	(40%-145%)
13C-205-OcCB		2000	2000	pg/L	100	(40%-145%)
13C-206-NoCB		2290	2000	pg/L	115	(40%-145%)
13C-208-NoCB		1920	2000	pg/L	96.2	(40%-145%)
13C-209-DeCB		2260	2000	pg/L	113	(40%-145%)
13C-28-TrCB		1200	2000	pg/L	59.9	(15%-145%)
13C-111-PeCB		1900	2000	pg/L	94.9	(40%-145%)
13C-178-HpCB		2000	2000	pg/L	100	(40%-145%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**12019815**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35954**				
Client ID:	**LCSD for batch 35954**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/23/2017 11:08**	**Analyst:**	**MLS**	**Instrument:**	**HRP875**
Data File:	**d23oct17a-3**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL
2051-60-7	1-MoCB		445	pg/L	4.36	20.0
2051-62-9	3-MoCB		517	pg/L	4.92	20.0
13029-08-8	4-DiCB		471	pg/L	12.5	20.0
2050-68-2	15-DiCB		548	pg/L	15.0	20.0
38444-73-4	19-TrCB		486	pg/L	6.98	20.0
38444-90-5	37-TrCB		496	pg/L	14.4	20.0
15968-05-5	54-TeCB		956	pg/L	2.84	20.0
32598-13-3	77-TeCB		908	pg/L	6.82	20.0
70362-50-4	81-TeCB		1010	pg/L	6.24	20.0
56558-16-8	104-PeCB		987	pg/L	1.24	20.0
32598-14-4	105-PeCB		1100	pg/L	8.90	20.0
74472-37-0	114-PeCB		998	pg/L	8.62	20.0
31508-00-6	118-PeCB		964	pg/L	7.94	20.0
65510-44-3	123-PeCB		970	pg/L	8.44	20.0
57465-28-8	126-PeCB		1070	pg/L	9.98	20.0
33979-03-2	155-HxCB		1090	pg/L	1.08	20.0
38380-08-4	156-HxCB	C	2180	pg/L	6.16	40.0
69782-90-7	157-HxCB	C156				
52663-72-6	167-HxCB		1120	pg/L	4.50	20.0
32774-16-6	169-HxCB		1060	pg/L	5.22	20.0
74487-85-7	188-HpCB		982	pg/L	1.50	20.0
39635-31-9	189-HpCB		1030	pg/L	2.92	20.0
2136-99-4	202-OcCB		1480	pg/L	2.04	20.0
74472-53-0	205-OcCB		1380	pg/L	2.14	20.0
40186-72-9	206-NoCB		1360	pg/L	3.42	20.0
52663-77-1	208-NoCB		1510	pg/L	2.44	20.0
2051-24-3	209-DeCB		1550	pg/L	1.22	20.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		922	2000	pg/L	46.1	(15%-145%)
13C-3-MoCB		1060	2000	pg/L	53.2	(15%-145%)
13C-4-DiCB		1290	2000	pg/L	64.3	(15%-145%)
13C-15-DiCB		1950	2000	pg/L	97.5	(15%-145%)
13C-19-TrCB		1770	2000	pg/L	88.7	(15%-145%)
13C-37-TrCB		1980	2000	pg/L	99.2	(15%-145%)
13C-54-TeCB		1340	2000	pg/L	67.1	(15%-145%)
13C-77-TeCB		2400	2000	pg/L	120	(40%-145%)
13C-81-TeCB		2390	2000	pg/L	119	(40%-145%)
13C-104-PeCB		1550	2000	pg/L	77.7	(40%-145%)
13C-105-PeCB		1730	2000	pg/L	86.4	(40%-145%)
13C-114-PeCB		1670	2000	pg/L	83.7	(40%-145%)
13C-118-PeCB		1690	2000	pg/L	84.5	(40%-145%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**1709F81**	**Client:**	**HALL001**	**Project:**	**HALL00117**
Lab Sample ID:	**12019815**			**Matrix:**	**WATER**
Client Sample:	**QC for batch 35954**				
Client ID:	**LCSD for batch 35954**			**Prep Basis:**	**As Received**
Batch ID:	**36029**	**Method:**	**EPA Method 1668C**		
Run Date:	**10/23/2017 11:08**	**Analyst:**	**MLS**	**Instrument:**	**HRP875**
Data File:	**d23oct17a-3**			**Dilution:**	**1**
Prep Batch:	**35954**	**Prep Method:**	**SW846 3520C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**17-OCT-17**	**Prep Aliquot:**	**1000 mL**		

CAS No.	Parmname	Qual	Result	Units	EDL	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-123-PeCB		1730	2000	pg/L	86.7	(40%-145%)
13C-126-PeCB		1790	2000	pg/L	89.4	(40%-145%)
13C-155-HxCB		1560	2000	pg/L	78.0	(40%-145%)
13C-156-HxCB	C	3150	4000	pg/L	78.8	(40%-145%)
13C-157-HxCB	C156L					
13C-167-HxCB		1620	2000	pg/L	81.1	(40%-145%)
13C-169-HxCB		1760	2000	pg/L	88.1	(40%-145%)
13C-188-HpCB		1470	2000	pg/L	73.5	(40%-145%)
13C-189-HpCB		1490	2000	pg/L	74.6	(40%-145%)
13C-202-OcCB		1480	2000	pg/L	74.0	(40%-145%)
13C-205-OcCB		1960	2000	pg/L	97.9	(40%-145%)
13C-206-NoCB		2220	2000	pg/L	111	(40%-145%)
13C-208-NoCB		1830	2000	pg/L	91.6	(40%-145%)
13C-209-DcCB		2200	2000	pg/L	110	(40%-145%)
13C-28-TrCB		1270	2000	pg/L	63.3	(15%-145%)
13C-111-PeCB		1840	2000	pg/L	92.0	(40%-145%)
13C-178-HpCB		1910	2000	pg/L	95.7	(40%-145%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1709F81
Pace Project No.: 30231771

Sample: 1709F81-001L Rio Grande-South- **Lab ID: 30231771001** Collected: 09/28/17 09:00 Received: 10/03/17 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**22.8 ± 5.05 (1.97) C:NA T:NA**	pCi/L	10/05/17 19:17	12587-46-1	
Adjusted Gross Alpha	EPA 900.0	**20.9 ± NA (NA) C:NA T:NA**	pCi/L	10/24/17 12:57		
Total Uranium	ASTM D5174-97	**2.87 ± 0.119 (0.193) C:NA T:NA**	ug/L	10/23/17 14:05	7440-61-1	

Sample: 1709F81-003L Rio Grande-North- **Lab ID: 30231771002** Collected: 09/27/17 12:00 Received: 10/03/17 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**4.27 ± 1.42 (1.48) C:NA T:NA**	pCi/L	10/05/17 19:17	12587-46-1	
Adjusted Gross Alpha	EPA 900.0	**2.91 ± NA (NA) C:NA T:NA**	pCi/L	10/24/17 12:57		
Total Uranium	ASTM D5174-97	**2.01 ± 0.084 (0.193) C:NA T:NA**	ug/L	10/23/17 14:17	7440-61-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 1709F81
Pace Project No.: 30231771

QC Batch: 274298 Analysis Method: ASTM D5174-97
QC Batch Method: ASTM D5174-97 Analysis Description: D5174.97 Total Uranium KPA
Associated Lab Samples: 30231771001, 30231771002

METHOD BLANK: 1349015 Matrix: Water
Associated Lab Samples: 30231771001, 30231771002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Total Uranium	0.085 ± 0.005 (0.193) C:NA T:NA	ug/L	10/10/17 16:39	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 1709F81
Pace Project No.: 30231771

QC Batch: 274175 Analysis Method: EPA 900.0
QC Batch Method: EPA 900.0 Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30231771001, 30231771002

METHOD BLANK: 1348495 Matrix: Water
Associated Lab Samples: 30231771001, 30231771002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.027 ± 0.617 (1.66) C:NA T:NA	pCi/L	10/06/17 09:05	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 1709F81
Pace Project No.: 30231771

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

QC SUMMARY REPORT

WO#: **1709F81**

Hall Environmental Analysis Laboratory, Inc.

31-Oct-17

Client: AMAFCA
Project: CMC

Sample ID **MB-34213** SampType: **MBLK** TestCode: **EPA Method 1664B**
Client ID: **PBW** Batch ID: **34213** RunNo: **46101**
Prep Date: **10/4/2017** Analysis Date: **10/4/2017** SeqNo: **1466493** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	ND	10.0								
Silica Gel Treated N-Hexane Extrac	ND	10.0								

Sample ID **LCS-34213** SampType: **LCS** TestCode: **EPA Method 1664B**
Client ID: **LCSW** Batch ID: **34213** RunNo: **46101**
Prep Date: **10/4/2017** Analysis Date: **10/4/2017** SeqNo: **1466494** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	33.4	10.0	40.00	0	83.5	78	114			
Silica Gel Treated N-Hexane Extrac	13.4	10.0	20.00	0	67.0	64	132			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA
Project: CMC

Sample ID **MB-34381** SampType: **MBLK** TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW** Batch ID: **34381** RunNo: **46397**
Prep Date: **10/12/2017** Analysis Date: **10/16/2017** SeqNo: **1478148** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								

Sample ID **LLLCS-34381** SampType: **LCSLL** TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC** Batch ID: **34381** RunNo: **46397**
Prep Date: **10/12/2017** Analysis Date: **10/16/2017** SeqNo: **1478149** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.55	1.0	0.5000	0	109	50	150			J
Magnesium	0.55	1.0	0.5000	0	111	50	150			J

Sample ID **LCS-34381** SampType: **LCS** TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW** Batch ID: **34381** RunNo: **46397**
Prep Date: **10/12/2017** Analysis Date: **10/16/2017** SeqNo: **1478150** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	50	1.0	50.00	0	99.2	85	115			
Magnesium	50	1.0	50.00	0	100	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA

Project: CMC

Sample ID **1709F81-001HLLMS** SampType: **MS** TestCode: **EPA 200.8: Dissolved Metals**

Client ID: **Rio Grande-South-2** Batch ID: **C46196** RunNo: **46196**

Prep Date: Analysis Date: **10/6/2017** SeqNo: **1470679** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	0.023	0.0010	0.02500	0.0009846	89.4	70	130			
Lead	0.013	0.00050	0.01250	0.0004747	97.5	70	130			

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**

Client ID: **LCSW** Batch ID: **C46196** RunNo: **46196**

Prep Date: Analysis Date: **10/6/2017** SeqNo: **1470730** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	0.024	0.0010	0.02500	0	94.1	85	115			
Lead	0.012	0.00050	0.01250	0	95.8	85	115			

Sample ID **LLLCS** SampType: **LCSLL** TestCode: **EPA 200.8: Dissolved Metals**

Client ID: **BatchQC** Batch ID: **C46196** RunNo: **46196**

Prep Date: Analysis Date: **10/6/2017** SeqNo: **1470734** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	0.00094	0.0010	0.001000	0	93.9	50	150			J
Lead	0.00048	0.00050	0.0005000	0	96.7	50	150			J

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**

Client ID: **PBW** Batch ID: **C46196** RunNo: **46196**

Prep Date: Analysis Date: **10/6/2017** SeqNo: **1470738** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	ND	0.0010								
Lead	ND	0.00050								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**
31-Oct-17

Client: AMAFCA
Project: CMC

Sample ID **MB** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW** Batch ID: **R46023** RunNo: **46023**
Prep Date: Analysis Date: **9/29/2017** SeqNo: **1463151** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								

Sample ID **LCS** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW** Batch ID: **R46023** RunNo: **46023**
Prep Date: Analysis Date: **9/29/2017** SeqNo: **1463152** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	0.98	0.10	1.000	0	98.3	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA

Project: CMC

Sample ID **MB-34138** SampType: **MBLK** TestCode: **SM5210B: BOD**

Client ID: **PBW** Batch ID: **34138** RunNo: **46131**

Prep Date: **9/29/2017** Analysis Date: **10/4/2017** SeqNo: **1467584** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	ND	2.0								

Sample ID **MB--34138** SampType: **MBLK** TestCode: **SM5210B: BOD**

Client ID: **PBW** Batch ID: **34138** RunNo: **46131**

Prep Date: **9/29/2017** Analysis Date: **10/4/2017** SeqNo: **1467585** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	ND	2.0								

Sample ID **LCS-34138** SampType: **LCS** TestCode: **SM5210B: BOD**

Client ID: **LCSW** Batch ID: **34138** RunNo: **46131**

Prep Date: **9/29/2017** Analysis Date: **10/4/2017** SeqNo: **1467586** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	150	2.0	198.0	0	75.4	60.3	136			

Sample ID **LCSD-34138** SampType: **LCSD** TestCode: **SM5210B: BOD**

Client ID: **LCSS02** Batch ID: **34138** RunNo: **46131**

Prep Date: **9/29/2017** Analysis Date: **10/4/2017** SeqNo: **1467587** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Biochemical Oxygen Demand	180	2.0	198.0	0	90.8	60.3	136	18.5	39.3	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**
31-Oct-17

Client: AMAFCA
Project: CMC

Sample ID **MB-34130** SampType: **MBLK** TestCode: **SM 9223B Fecal Indicator: E. coli MPN**
Client ID: **PBW** Batch ID: **34130** RunNo: **46014**
Prep Date: **9/28/2017** Analysis Date: **9/29/2017** SeqNo: **1462872** Units: **MPN/100mL**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
E. Coli	<1	1.000								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1709F81**

Hall Environmental Analysis Laboratory, Inc.

31-Oct-17

Client: AMAFCA
Project: CMC

Sample ID **MB** SampType: **MBLK** TestCode: **SM 4500 NH3: Ammonia**
Client ID: **PBW** Batch ID: **R46385** RunNo: **46385**
Prep Date: Analysis Date: **10/16/2017** SeqNo: **1477737** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	1.0								

Sample ID **LCS** SampType: **LCS** TestCode: **SM 4500 NH3: Ammonia**
Client ID: **LCSW** Batch ID: **R46385** RunNo: **46385**
Prep Date: Analysis Date: **10/16/2017** SeqNo: **1477738** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA

Project: CMC

Sample ID **MB-34388** SampType: **MBLK** TestCode: **EPA Method 365.1: Total Phosphorous**

Client ID: **PBW** Batch ID: **34388** RunNo: **46373**

Prep Date: **10/12/2017** Analysis Date: **10/13/2017** SeqNo: **1477407** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	ND	0.010								

Sample ID **LCS-34388** SampType: **LCS** TestCode: **EPA Method 365.1: Total Phosphorous**

Client ID: **LCSW** Batch ID: **34388** RunNo: **46373**

Prep Date: **10/12/2017** Analysis Date: **10/13/2017** SeqNo: **1477408** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	0.25	0.010	0.2500	0	100	90	110			

Sample ID **1709F81-003FMS** SampType: **MS** TestCode: **EPA Method 365.1: Total Phosphorous**

Client ID: **Rio Grande-North-2** Batch ID: **34388** RunNo: **46373**

Prep Date: **10/12/2017** Analysis Date: **10/13/2017** SeqNo: **1477413** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	1.5	0.050	1.250	0.2770	95.1	90	110			D

Sample ID **1709F81-003FMSD** SampType: **MSD** TestCode: **EPA Method 365.1: Total Phosphorous**

Client ID: **Rio Grande-North-2** Batch ID: **34388** RunNo: **46373**

Prep Date: **10/12/2017** Analysis Date: **10/13/2017** SeqNo: **1477414** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	1.5	0.050	1.250	0.2770	96.6	90	110	1.32	20	D

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA
Project: CMC

Sample ID **MB-34208**	SampType: **MBLK**			TestCode: **SM2540C MOD: Total Dissolved Solids**						
Client ID: **PBW**	Batch ID: **34208**			RunNo: **46103**						
Prep Date: **10/3/2017**	Analysis Date: **10/4/2017**			SeqNo: **1466592**	Units: **mg/L**					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-34208**	SampType: **LCS**			TestCode: **SM2540C MOD: Total Dissolved Solids**						
Client ID: **LCSW**	Batch ID: **34208**			RunNo: **46103**						
Prep Date: **10/3/2017**	Analysis Date: **10/4/2017**			SeqNo: **1466593**	Units: **mg/L**					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA

Project: CMC

Sample ID **MB-34412** SampType: **MBLK** TestCode: **SM 4500 Norg C: TKN**

Client ID: **PBW** Batch ID: **34412** RunNo: **46404**

Prep Date: **10/14/2017** Analysis Date: **10/17/2017** SeqNo: **1478457** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID **LCS-34412** SampType: **LCS** TestCode: **SM 4500 Norg C: TKN**

Client ID: **LCSW** Batch ID: **34412** RunNo: **46404**

Prep Date: **10/14/2017** Analysis Date: **10/17/2017** SeqNo: **1478458** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	10	1.0	10.00	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1709F81**

31-Oct-17

Client: AMAFCA

Project: CMC

Sample ID **MB-34153** SampType: **MBLK** TestCode: **SM 2540D: TSS**

Client ID: **PBW** Batch ID: **34153** RunNo: **46033**

Prep Date: **9/29/2017** Analysis Date: **10/2/2017** SeqNo: **1463367** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0								

Sample ID **LCS-34153** SampType: **LCS** TestCode: **SM 2540D: TSS**

Client ID: **LCSW** Batch ID: **34153** RunNo: **46033**

Prep Date: **9/29/2017** Analysis Date: **10/2/2017** SeqNo: **1463368** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	96	4.0	91.10	0	105	84.63	120.75			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: 1709F81   RcptNo: 1

Received By: **Jackie Bolte** 9/28/2017 1:40:00 PM Jackie Bolte

Completed By: **Anne Thorne** 9/28/2017 2:31:10 PM Anne Thorne

Reviewed By: JO 09/29/17

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
   Approved by client.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: 14
(<2 or >12 unless noted)
Adjusted? —
Checked by: AT 09/29/17

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.8	Good	Not Present			

Collaborative Monitoring Cooperative - Analyses List
Attach to Chain of Custody

Analyte (Bold indicates WQS)	CAS #	Fraction	Method #	MDL (ug/L)
Hardness (Ca + Mg)	NA	Total	200.7	2.4
Lead	7439-92-1	Dissolved	200.8	0.09
Copper	7440-50-8	Dissolved	200.8	1.06
Ammonia + organic nitrogen	7664-41-7	Total	350.1	31.32
Total Kjehldal Nitrogen	17778-88-0	Total	351.2	58.78
Nitrate + Nitrite	14797-55-8	Total	353.2	10.17
Polychlorinated biphenyls (PCBs)	1336-36-3	Total	1668	0.014
Tetrahydrofuran (THF)	109-99-9	Total	8260C	7.9
bis(2-Ethylhexyl)phthalate	117-81-7	Total	8270D	0.2
Dibenzofuran	132-64-9	Total	8270D	0.2
Indeno(1,2,3-cd)pyrene	193-39-5	Total	8270D	0.2
Benzo(b)fluoranthene	205-99-2	Total	8270D	0.1
Benzo(k)fluoranthene	207-08-9	Total	8270D	0.1
Chrysene	218-01-9	Total	8270D	0.2
Benzo(a)pyrene	50-32-8	Total	8270D	0.3
Dibenzo(a,h)anthracene	53-70-3	Total	8270D	0.3
Benzo(a)anthracene	56-55-3	Total	8270D	0.2
Dieldrin	60-57-1	Total	8270D	0.1
Pentachlorophenol	87-86-5	Total	8270D	0.2
Benzidine	92-87-5	Total	8270D	0.1
Chemical Oxygen Demand	E1641638[2]	Total	HACH	5100
Gross alpha (adjusted)	NA	Total	Method 900	0.1 pCi/L
Total Dissolved Solids	E1642222[2]	Total	SM 2540C	60.4
Total Suspended Solids	NA	Total	SM 2540D	3450
Biological Oxygen Demand	N/A	Total	Standard Methods	930
Oil and Grease		Total	1664A	5000
Ecoli — num			SM 9223B	
pH			SM 4500	
Phosphorus		Dissolved	365.1	100
Phosphorus		Total	365.1	100
Chromium IV		Total	3500Cr C-2011	100

S:\Projects\NM15.0156_SSCAFCA_Stormwater\Docs\Stormwater Sampling\2016_Parameter list_CMC.doc
11/2/2016

Chain-of-Custody Record

Client: AMAFCA

Mailing Address: 2000 Prospect

Phone #: 884-2215

email or Fax#: pchavez@amafca.org

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:
☒ Standard ☐ **Rush** ______

Project Name: CMC

Project #:

Project Manager: Patrick Chavez

Sampler:

On Ice: ☑ Yes ☐ No

Sample Temperature: 5.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1709F81	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	E. coli - enumer	See Attached sheet			Air Bubbles (Y or N)
9/28/17	0900	AQ	Riogrande-South-20170928			-005 -001												X	X			
9/27/17	1200	AQ	Rio Grande-North-20170927			-006 -002													X			
			Trip Blank			-004 -003																

AT 09/28/17

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/28/17	1340	[signature]	[signature]	9/28/17	1340
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Appendix F - Minimum Quantification Levels (MQL's)

The following Minimum Quantification Levels (MQL's) are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
METALS, RADIOACTIVITY, CYANIDE and CHLORINE			
Aluminum	2.5	Molybdenum	10
Antimony	60	Nickel	0.5
Arsenic	0.5	Selenium	5
Barium	100	Silver	0.5
Beryllium	0.5	Thalllium	0.5
Boron	100	Uranium	0.1
Cadmium	1	Vanadium	50
Chromium	10	Zinc	20
Cobalt	50	Cyanide	10
Copper	0.5	Cyanide, weak acid dissociable	10
Lead	0.5	Total Residual Chlorine	33
Mercury (*)	0.0005 0.005		
DIOXIN			
2,3,7,8-TCDD	0.00001		
VOLATILE COMPOUNDS			
Acrolein	50	1,3-Dichloropropylene	10
Acrylonitrile	20	Ethylbenzene	10
Benzene	10	Methyl Bromide	50
Bromoform	10	Methylene Chloride	20
Carbon Tetrachloride	2	1,1,2,2-Tetrachloroethane	10
Chlorobenzene	10	Tetrachloroethylene	10
Clorodibromomethane	10	Toluene	10
Chloroform	50	1,2-trans-Dichloroethylene	10
Dichlorobromomethane	10	1,1,2-Trichloroethane	10
1,2-Dichloroethane	10	Trichloroethylene	10
1,1-Dichloroethylene	10	Vinyl Chloride	10
1,2-Dichloropropane	10		
ACID COMPOUNDS			
2-Chlorophenol	10	2,4-Dinitrophenol	50
2,4-Dichlorophenol	10	Pentachlorophenol	5
2,4-Dimethylphenol	10	Phenol	10
4,6-Dinitro-o-Cresol	50	2,4,6-Trichlorophenol	10

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 02, 2017

Pre-storm Rio Grnade South - Isleta Dam location

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

RE: CMC   OrderNo.: 1709F32

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1709F32**
Date Reported: **10/2/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: CMC
Lab ID: 1709F32-001 **Matrix:** AQUEOUS

Client Sample ID: Isleta Dam
Collection Date: 9/27/2017 12:00:00 PM
Received Date: 9/27/2017 3:00:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM 9223B FECAL INDICATOR: E. COLI MPN							Analyst: **SMS**
E. Coli	2359	10.00		MPN/100mL	10	9/28/2017 6:51:00 PM	34113

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: 1709F32   RcptNo: 1

Received By: Erin Melendrez   9/27/2017 3:00:00 PM

Completed By: Sophia Campuzano   9/27/2017 3:27:13 PM   Sophia Campuzano

Reviewed By: ENM   9/27/17@ 1535

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Samples were collected the same day and chilled.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ________
(<2 or >12 unless noted)
Adjusted? ________
Checked by: ________

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ________ Date: ________
By Whom: ________ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ________
Client Instructions: ________

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	7.1	Good	Not Present			

Chain-of-Custody Record

Client: AMAFCA - CMC

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ________

☐ EDD (Type) ________

Turn-Around Time:
☐ Standard ☐ Rush ________

Project Name: CMC

Project #:

Project Manager: Patrick Chavez

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 7.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1709F32	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	enumeration				Air Bubbles (Y or N)
			ENM 9/27/17																			
9/27	12:00	AQ	Isleta Dam			-001												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/27	3:00	PJC [signature]	[signature]	9/27/17	1500
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 02, 2017

Pre-storm results for multiple locations

Patrick Chavez
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107
TEL: (505) 884-2215
FAX

RE: E Coli Study

OrderNo.: 1709F30

Dear Patrick Chavez:

Hall Environmental Analysis Laboratory received 3 sample(s) on 9/27/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMAFCA
Project: E Coli Study
Lab Order: 1709F30

Lab ID: 1709F30-001 | **Collection Date:** 9/27/2017 1:20:00 PM
Client Sample ID: ABQ-RD-EAST | **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM 9223B FECAL INDICATOR: E. COLI MPN						Analyst: **SMS**	
E. Coli	1565	10.00		MPN/100mL	10	9/28/2017 6:51:00 PM	34113

Lab ID: 1709F30-002 | **Collection Date:** 9/27/2017 1:30:00 PM
Client Sample ID: ABQ-RC-I25 | **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM 9223B FECAL INDICATOR: E. COLI MPN						Analyst: **SMS**	
E. Coli	1723	10.00		MPN/100mL	10	9/28/2017 6:51:00 PM	34113

Lab ID: 1709F30-003 | **Collection Date:** 9/27/2017 12:50:00 PM
Client Sample ID: ABQ-DD-WEST | **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
SM 9223B FECAL INDICATOR: E. COLI MPN						Analyst: **SMS**	
E. Coli	82.3	1.000		MPN/100mL	1	9/28/2017 6:51:00 PM	34113

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: AMAFCA   Work Order Number: **1709F30**   RcptNo: **1**

Received By: **Erin Melendrez** **9/27/2017 3:00:00 PM**

Completed By: **Sophia Campuzano** **9/27/2017 3:22:59 PM** Sophia Campuzano

Reviewed By: ENM 9/27/17 @ 1535

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Samples were collected the same day and chilled.
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ____________
(<2 or >12 unless noted)
Adjusted? ____________
Checked by: ____________

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	7.1	Good	Not Present			

Chain-of-Custody Record

Client: AMAFCA

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other ____

☐ EDD (Type) ____

Turn-Around Time:

☐ Standard ☐ **Rush** ____

Project Name: E. coli Study

Project #:

Project Manager: Patrick Chavez

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 7.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1709F30	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Enumeration				Air Bubbles (Y or N)
			ENM 9/27/17																			
9/27	1:20	AQ	ABQ-RD-EAST			-001												X				
9/27	1:30		ABQ-RC-I25			-002												X				
9/27	12:50		ABQ-DD-West			-003												X				

Date	Time	Relinquished by	Received by	Date	Time
9/27	3:00	PJC [signature]	[signature]	9/27/17	1500

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

ATTACHMENT 2

FY 2018 WET SEASON COMPLETED DATA VERIFICATION AND VALIDATION FORMS

Attachment 1.1 Water Quality Sample Data Verification and Validation Worksheet

Study Name: Compliance Monitoring Cooperative (CMC)
Year: FY 2018 (July 2017 – Wet Season Sample)
Project Coordinator: For Data Review and Reporting – SJG, BHI
V&V Reviewer: SJG
Data covered by this worksheet: Rio Grande North – 7/27/17 and 7/28/17
Version of Verification/Validation Procedures: QAPP – SOP #2 (2/2015)

Step 1: Verify Field Data

A. Are all Field Data forms present and complete? ☒ Yes ☐ No

If yes, proceed; if no, attempt to locate missing forms, then indicate any remaining missing forms and action taken.

Missing Field Data Forms	Action Taken
______	______
______	______

Total number of occurrences: 0

B. Are station name and ID, and sampling date and time on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station and Parameter	Action Taken	Re-verified?
_____	_____	________
_____	_____	________

Total number of occurrences: 0

C. Are field data on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station	Sampling Date	Parameter(s) Corrected	Re-verified?
______	______	______	________
______	______	______	________

Total number of occurrences: 0

D. Are RIDs correct and associated with the correct analytical suite, media subdivision (e.g. surface water, municipal waste, etc.) and activity type (e.g. Field observation, Routine sample, QA sample etc.)?
☒ Yes ☐ No

If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify

Station/RID	Sampling Date	RID Corrected	Re-verified?
______	______	______	_________
______	______	______	_________

Total number of occurrences: **0**

☒ **Step 1 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 2: Verify Data Deliverables
A. Have all data in question been delivered? ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing data (samples or blanks) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken. Complete this step upon receipt of all missing data.

RID	Submittal Date	Missing Data/Parameters	Date of Initial Verification	Date Missing Data Were Received
______	______	______	______	______
______	______	______	______	______

Total number of occurrences: **0**

B. Do all of the analytical suites have the correct number and type of analytes. ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing or incorrect analyte(s) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken.
*Note – Lab report identifies “Dissolved Phosphorous” as “Total Phosphorous” on a filtered sample (identified under “Client Sample ID”). Also, three parameters are listed in the Lab Report Analytical Notes – Tetrahydrofuran, Benzidine, and Dieldrin – all were not detected. All three are not listed in the reportable compounds tables.

RID	Submittal Date	Missing or Incorrect Parameters	Action Taken	Re-verified?
______	______	______	______	______
______	______	______	______	______

☒ **Step 2 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 3: Verify Flow Data
*Note – Not Applicable – no flow data provided with CMC sample collection
A. Identify incorrect or missing data on the flow calculation spreadsheet and correct errors.

Station	Sampling Date	Flow data missing or incorrect?
______	______	_________
______	______	_________

Total number of occurrences: 0

B. Identify incorrect or missing discharge measurements, correct errors in database and re-verify.

Station	Sampling Date	Flow data missing or incorrect?	Re-verified?
______	______	_________	_________
______	______	_________	_________

Total number of occurrences: 0

Not Applicable
☐ **Step 3 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 4: Verify Analytical Results for Missing Information or Questionable Results

Were any results with missing/questionable information identified? ☒ Yes ☐ No

If no, proceed; if yes, indicate results with missing information or questionable results or attach report. Contact data source and indicate action taken. Complete this step upon receipt of missing information or clarification of questionable results (clarify questionable results only, DO NOT change results without written approval (from lab or QA officer) and associated documentation).

RID	Sample Date	Missing or Questionable Information/Results	Action Taken
Rio Grande North	7/27/17	Lab report provides Dissolved Phosphorous results as “Total Phosphorous” for “filtered sample”.	Notified AMAFCA of this and verified with HEAL. BHI added note to the lab report.
Rio Grande North	7/27/17	Tetrahydrofuran not found along numerical results.	Analytical notes state that Tetrahydrofuran was not included in the list of reportable compounds. Compound was not detected.
Rio Grande North	7/27/17	Benzidine and Dieldrin not found along numerical results.	Analytical notes state that Benzidine and Dieldrin were not included in the list of reportable compounds. Compounds were not detected.

*Note – HEAL Lab report order numbers – 1707E46 and 1707E07

Total number of occurrences: 3

☒ **Step 4 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 5: Validate Blanks Results

Were any analytes of concern detected in blank samples? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager, with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes have been added to database correctly.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database?*
_____	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged and include on *Validation Codes Form*.

Total number of occurrences: 0

☒ **Step 5 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 6: Validate Holding Times Violations
Were any samples submitted that did not meet specified holding times? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database to ALL associated data?*
______	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged.
*Note – Lab reports lists pH with hold time flag. Database uses field data reported pH, so this is hold time is not applicable.
Total number of occurrences: 0

☒ **Step 6 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 7: Validate Replicate/Duplicate Results (if applicable)
Were any replicate/duplicate pairs submitted outside of the established control limit of 20%?
☐ Yes ☒ No
If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID Pairs		Replicate or Duplicate?	Sample Date	Parameter	RPD	Validation Code/Flag Applied	Code/Flag verified in database applied?*
______	______	______	______	______	______		________
______	______	______	______	______	______		________

*See validation procedures to determine which associated data need to be flagged.

Total number of occurrences: **0**

☒ **Step 7 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

****

After all of the above steps have been completed, save and print the worksheet, attach all applicable supplemental information and sign below.

I acknowledge that the data verification and validation process has been completed for the data identified above in accordance with the procedures described in the CMC QAPP, SOP #2

10/26/17

Data Verifier/Validator Signature Date

COMPLETION OF DATA VERIFICATION AND VALIDATION PROCESS

Once the data verification and validation process has been completed for the entire study (note: if the worksheet is for a subset of the data from a study, be sure ALL the data for the entire study is included before final completion of the data verification and validation process), notify the NMSQUID administrator that the process is complete and request that “V V in STORET” be added to the project title.

Once all data have been verified and validated for a study provide copies of ALL *Data Verification and Validation Worksheets* and attachments associated with the study to the Quality Assurance Officer and retain originals in the project binder.

Attachment 1.2 SWQB Validation Codes

When deficiencies are identified through the data verification and validation process, AMAFCA documents or "flags" the deficiencies by assigning validation codes. All data collected from the last compliant QC sample and up to the next compliant QC sample are assigned validation codes.
The validation code alerts the data user that the results are outside QA control limits and may require re-sampling or a separate, qualitative analysis based on professional judgment.

Validation Code	Definition	WQX Equivalent
A1	Sample not collected according to SOP	
B1	Chemical was detected in the field blank at a concentration less than 5% of the sample concentration.	
BN	Blanks NOT collected during sampling run	
BU	Detection in blank. Analyte was not detected in this sample above the method's sample detection limit.	BU
RB1	Chemical was detected in the field blank at a concentration greater than or equal to 5% of the sample concentration. Results for this sample are rejected because they may be the result of contamination; the results may not be reported or used for regulatory compliance purposes.	B
R1	Rejected due to incorrect sample preservation	R
R2	Rejected due to equipment failure in the field	R
R3	Rejected based on best professional judgment	R
D1	Spike recovery not within method acceptance limits	
F1	Sample filter time exceeded	
J1	Estimated: the analyte was positively identified and the associated value is an approximate concentration of the analyte in the sample	J
K1	Holding time violation	H
Ea	Estimated-Incubation temperature between 35.5 and 38.0° Celsius	
Er	Rejected-Incubation temperature < 34.5 or >38.0° Celsius	
PD1	Percent difference between duplicate samples excessive	
S1	Per SLD, uncertainties (sigmas) are expressed as one standard deviation, i.e. one standard error. Small negative or positive values that are less than two standard deviations should be interpreted as "less than the detection limit."	
S2	Data are suspect but deemed usable based on best professional judgment; documentation of justification is required and should be included in the Data Verification and Validation Packet and reported with results	
Z1	Macroinvertebrate data did not meet QC criteria specified in Section 2.5 of QAPP	
H1	Habitat data did not meet QC criteria specified in Section 2.5 of QAPP	

Attachment 1.1 Water Quality Sample Data Verification and Validation Worksheet

Study Name: **Compliance Monitoring Cooperative (CMC)**
Year: **FY 2018 (July 2017 – Wet Season Sample)**
Project Coordinator: **For Data Review and Reporting – SJG, BHI**
V&V Reviewer: **SJG**
Data covered by this worksheet: **Rio Grande South – 7/28/17**
Version of Verification/Validation Procedures: **QAPP – SOP #2 (2/2015)**

Step 1: Verify Field Data

A. Are all Field Data forms present and complete? ☒ Yes ☐ No

If yes, proceed; if no, attempt to locate missing forms, then indicate any remaining missing forms and action taken.

Missing Field Data Forms	Action Taken
______	______
______	______

Total number of occurrences: 0

B. Are station name and ID, and sampling date and time on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station and Parameter	Action Taken	Re-verified?
_____	_____	_________
_____	_____	_________

Total number of occurrences: 0

C. Are field data on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station	Sampling Date	Parameter(s) Corrected	Re-verified?
______	______	______	_________
______	______	______	_________

Total number of occurrences: 0

D. Are RIDs correct and associated with the correct analytical suite, media subdivision (e.g. surface water, municipal waste, etc.) and activity type (e.g. Field observation, Routine sample, QA sample etc.)?
☒ Yes ☐ No

If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify

Station/RID	Sampling Date	RID Corrected	Re-verified?
______	______	______	_________
______	______	______	_________

Total number of occurrences: **0**

☒ **Step 1 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 2: Verify Data Deliverables

A. Have all data in question been delivered? ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing data (samples or blanks) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken. Complete this step upon receipt of all missing data.

RID	Submittal Date	Missing Data/Parameters	Date of Initial Verification	Date Missing Data Were Received
______	______	______	______	______
______	______	______	______	______

Total number of occurrences: **0**

B. Do all of the analytical suites have the correct number and type of analytes. ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing or incorrect analyte(s) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken.
*Note – Lab report identifies “Dissolved Phosphorous” as “Total Phosphorous” on a filtered sample (identified under “Client Sample ID”). Also, three parameters are listed in the Lab Report Analytical Notes – Tetrahydrofuran, Benzidine, and Dieldrin – all were not detected. All three are not listed in the reportable compounds tables..

RID	Submittal Date	Missing or Incorrect Parameters	Action Taken	Re-verified?
______	______	______	______	______
______	______	______	______	______

☒ **Step 2 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 3: Verify Flow Data

*Note – Not Applicable – no flow data provided with CMC sample collection

A. Identify incorrect or missing data on the flow calculation spreadsheet and correct errors.

Station	Sampling Date	Flow data missing or incorrect?
______	______	_________
______	______	_________

Total number of occurrences: 0

B. Identify incorrect or missing discharge measurements, correct errors in database and re-verify.

Station	Sampling Date	Flow data missing or incorrect?	Re-verified?
______	______	_________	_________
______	______	_________	_________

Total number of occurrences: 0

Not Applicable

☐ **Step 3 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 4: Verify Analytical Results for Missing Information or Questionable Results

Were any results with missing/questionable information identified? ☒ Yes ☐ No

If no, proceed; if yes, indicate results with missing information or questionable results or attach report. Contact data source and indicate action taken. Complete this step upon receipt of missing information or clarification of questionable results (clarify questionable results only, DO NOT change results without written approval (from lab or QA officer) and associated documentation).

RID	Sample Date	Missing or Questionable Information/Results	Action Taken
Rio Grande South	7/28/17	Lab report provides Dissolved Phosphorous results as “Total Phosphorous” for “filtered sample”.	Notified AMAFCA of this and verified with HEAL. BHI added note to the lab report.
Rio Grande South	7/28/17	Hexavalent Chromium and COD for Rio Grande South incorrectly labeled in lab report as Rio Grande North	Confirmed lab results and monitoring location with HEAL. BHI added note to the lab report.
Rio Grande South	7/28/17	Tetrahydrofuran not found along numerical results.	Analytical notes state that Tetrahydrofuran was not included in the list of reportable compounds. Compound was not detected.
Rio Grande South	7/28/17	Benzidine and Dieldrin not found along numerical results.	Analytical notes state that Benzidine and Dieldrin were not included in the list of reportable compounds. Compounds were not detected.

*Note – HEAL Lab report order number – 1707E46

Total number of occurrences: **1**

☒ **Step 4 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 5: Validate Blanks Results

Were any analytes of concern detected in blank samples? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager, with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes have been added to database correctly.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database? *
_____	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged and include on *Validation Codes Form*.

Total number of occurrences: 0

☒ **Step 5 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 6: Validate Holding Times Violations
Were any samples submitted that did not meet specified holding times? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database to ALL associated data?*
______	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged.
*Note – Lab reports lists pH with hold time flag. Database uses field data reported pH, so this is hold time is not applicable.
Total number of occurrences: 0

☒ **Step 6 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

- -

Step 7: Validate Replicate/Duplicate Results (if applicable)
Were any replicate/duplicate pairs submitted outside of the established control limit of 20%?
☐ Yes ☒ No
If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID Pairs		Replicate or Duplicate?	Sample Date	Parameter	RPD	Validation Code/Flag Applied	Code/Flag verified in database applied?*
______	______	______	______	______	______		________
______	______	______	______	______	______		________

*See RGN Form.

Total number of occurrences: 0

☒ **Step 7 Completed** ***Initials:*** SJG ***Date:*** 10/26/17

****

After all of the above steps have been completed, save and print the worksheet, attach all applicable supplemental information and sign below.

I acknowledge that the data verification and validation process has been completed for the data identified above in accordance with the procedures described in the CMC QAPP, SOP #2

Sarah Gransey 10/26/17

Data Verifier/Validator Signature Date

COMPLETION OF DATA VERIFICATION AND VALIDATION PROCESS

Once the data verification and validation process has been completed for the entire study (note: if the worksheet is for a subset of the data from a study, be sure ALL the data for the entire study is included before final completion of the data verification and validation process), notify the NMSQUID administrator that the process is complete and request that "V V in STORET" be added to the project title.

Once all data have been verified and validated for a study provide copies of ALL *Data Verification and Validation Worksheets* and attachments associated with the study to the Quality Assurance Officer and retain originals in the project binder.

Attachment 1.2 SWQB Validation Codes

When deficiencies are identified through the data verification and validation process, AMAFCA documents or "flags" the deficiencies by assigning validation codes. All data collected from the last compliant QC sample and up to the next compliant QC sample are assigned validation codes.
The validation code alerts the data user that the results are outside QA control limits and may require re-sampling or a separate, qualitative analysis based on professional judgment.

Validation Code	Definition	WQX Equivalent
A1	Sample not collected according to SOP	
B1	Chemical was detected in the field blank at a concentration less than 5% of the sample concentration.	
BN	Blanks NOT collected during sampling run	
BU	Detection in blank. Analyte was not detected in this sample above the method's sample detection limit.	BU
RB1	Chemical was detected in the field blank at a concentration greater than or equal to 5% of the sample concentration. Results for this sample are rejected because they may be the result of contamination; the results may not be reported or used for regulatory compliance purposes.	B
R1	Rejected due to incorrect sample preservation	R
R2	Rejected due to equipment failure in the field	R
R3	Rejected based on best professional judgment	R
D1	Spike recovery not within method acceptance limits	
F1	Sample filter time exceeded	
J1	Estimated: the analyte was positively identified and the associated value is an approximate concentration of the analyte in the sample	J
K1	Holding time violation	H
Ea	Estimated-Incubation temperature between 35.5 and 38.0° Celsius	
Er	Rejected-Incubation temperature < 34.5 or >38.0° Celsius	
PD1	Percent difference between duplicate samples excessive	
S1	Per SLD, uncertainties (sigmas) are expressed as one standard deviation, i.e. one standard error. Small negative or positive values that are less than two standard deviations should be interpreted as "less than the detection limit."	
S2	Data are suspect but deemed usable based on best professional judgment; documentation of justification is required and should be included in the Data Verification and Validation Packet and reported with results	
Z1	Macroinvertebrate data did not meet QC criteria specified in Section 2.5 of QAPP	
H1	Habitat data did not meet QC criteria specified in Section 2.5 of QAPP	

Attachment 1.1 Water Quality Sample Data Verification and Validation Worksheet

Study Name: Compliance Monitoring Cooperative (CMC)
Year: FY 2018 (Sept 2017 – Wet Season Sample)
Project Coordinator: For Data Review and Reporting – SJG, BHI
V&V Reviewer: SJG
Data covered by this worksheet: Rio Grande North – 9/27/17 and 9/28/17
Version of Verification/Validation Procedures: QAPP – SOP #2 (2/2015)

Step 1: Verify Field Data

A. Are all Field Data forms present and complete? ☒ Yes ☐ No

If yes, proceed; if no, attempt to locate missing forms, then indicate any remaining missing forms and action taken.

Missing Field Data Forms	Action Taken
_____	_____
_____	_____

Total number of occurrences: 0

B. Are station name and ID, and sampling date and time on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station and Parameter	Action Taken	Re-verified?
_____	_____	_____
_____	_____	_____

Total number of occurrences: 0

C. Are field data on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station	Sampling Date	Parameter(s) Corrected	Re-verified?
_____	_____	_____	_____
_____	_____	_____	_____

Total number of occurrences: 0

D. Are RIDs correct and associated with the correct analytical suite, media subdivision (e.g. surface water, municipal waste, etc.) and activity type (e.g. Field observation, Routine sample, QA sample etc.)?
☒ Yes ☐ No

If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify

Station/RID	Sampling Date	RID Corrected	Re-verified?
______	______	______	_________
______	______	______	_________

Total number of occurrences: **0**

☒ **Step 1 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 2: Verify Data Deliverables

A. Have all data in question been delivered? ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing data (samples or blanks) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken. Complete this step upon receipt of all missing data.

RID	Submittal Date	Missing Data/Parameters	Date of Initial Verification	Date Missing Data Were Received
______	______	______	______	______
______	______	______	______	______

Total number of occurrences: **0**

B. Do all of the analytical suites have the correct number and type of analytes. ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing or incorrect analyte(s) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken.
*Note – Lab report identifies “Dissolved Phosphorous” as “Total Phosphorous” on a filtered sample (identified under “Client Sample ID”).

RID	Submittal Date	Missing or Incorrect Parameters	Action Taken	Re-verified?
______	______	______	______	______
______	______	______	______	______

☒ **Step 2 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

Step 3: Verify Flow Data

*Note – Not Applicable – no flow data provided with CMC sample collection

A._Identify incorrect or missing data on the flow calculation spreadsheet and correct errors.

Station	Sampling Date	Flow data missing or incorrect?
______	______	_________
______	______	_________

Total number of occurrences: 0

B. Identify incorrect or missing discharge measurements, correct errors in database and re-verify.

Station	Sampling Date	Flow data missing or incorrect?	Re-verified?
______	______	_________	_________
______	______	_________	_________

Total number of occurrences: 0

Not Applicable

☐ **Step 3 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

Step 4: Verify Analytical Results for Missing Information or Questionable Results

Were any results with missing/questionable information identified? ☒ Yes ☐ No

If no, proceed; if yes, indicate results with missing information or questionable results or attach report. Contact data source and indicate action taken. Complete this step upon receipt of missing information or clarification of questionable results (clarify questionable results only, DO NOT change results without written approval (from lab or QA officer) and associated documentation).

RID	Sample Date	Missing or Questionable Information/Results	Action Taken
Rio Grande North	9/27/17	Lab report provides Dissolved Phosphorous results as "Total Phosphorous" for "filtered sample".	Notified AMAFCA of this and verified with HEAL. BHI added note to the lab report.

*Note – HEAL Lab report order numbers – 1709F09 (E. coli on 9/27/17) and 1709F81(remaining parameters)

Total number of occurrences: 1

☒ **Step 4 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

Step 5: Validate Blanks Results

Were any analytes of concern detected in blank samples? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager, with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes have been added to database correctly.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database? *

*See validation procedures to determine which associated data need to be flagged and include on *Validation Codes Form*.

Total number of occurrences: 0

☒ **Step 5 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

Step 6: Validate Holding Times Violations

Were any samples submitted that did not meet specified holding times? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database to ALL associated data?*
______	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged.
*Note – Lab reports lists pH with hold time flag. Database uses field data reported pH, so this is hold time is not applicable.
Total number of occurrences: 0

☒ **Step 6 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 7: Validate Replicate/Duplicate Results (if applicable)
Were any replicate/duplicate pairs submitted outside of the established control limit of 20%?
☐ Yes ☒ No
If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID Pairs		Replicate or Duplicate?	Sample Date	Parameter	RPD	Validation Code/Flag Applied	Code/Flag verified in database applied?*
______	______	______	______	______	______		_________
______	______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged.

Total number of occurrences: 0

☒ **Step 7 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

****

After all of the above steps have been completed, save and print the worksheet, attach all applicable supplemental information and sign below.

I acknowledge that the data verification and validation process has been completed for the data identified above in accordance with the procedures described in the CMC QAPP, SOP #2

Sarah Conway 12/27/17

Data Verifier/Validator Signature Date

COMPLETION OF DATA VERIFICATION AND VALIDATION PROCESS

Once the data verification and validation process has been completed for the entire study (note: if the worksheet is for a subset of the data from a study, be sure ALL the data for the entire study is included before final completion of the data verification and validation process), notify the NMSQUID administrator that the process is complete and request that "V V in STORET" be added to the project title.

Once all data have been verified and validated for a study provide copies of ALL *Data Verification and Validation Worksheets* and attachments associated with the study to the Quality Assurance Officer and retain originals in the project binder.

Attachment 1.2 SWQB Validation Codes

When deficiencies are identified through the data verification and validation process, AMAFCA documents or “flags” the deficiencies by assigning validation codes. All data collected from the last compliant QC sample and up to the next compliant QC sample are assigned validation codes.
The validation code alerts the data user that the results are outside QA control limits and may require re-sampling or a separate, qualitative analysis based on professional judgment.

Validation Code	Definition	WQX Equivalent
A1	Sample not collected according to SOP	
B1	Chemical was detected in the field blank at a concentration less than 5% of the sample concentration.	
BN	Blanks NOT collected during sampling run	
BU	Detection in blank. Analyte was not detected in this sample above the method's sample detection limit.	BU
RB1	Chemical was detected in the field blank at a concentration greater than or equal to 5% of the sample concentration. Results for this sample are rejected because they may be the result of contamination; the results may not be reported or used for regulatory compliance purposes.	B
R1	Rejected due to incorrect sample preservation	R
R2	Rejected due to equipment failure in the field	R
R3	Rejected based on best professional judgment	R
D1	Spike recovery not within method acceptance limits	
F1	Sample filter time exceeded	
J1	Estimated: the analyte was positively identified and the associated value is an approximate concentration of the analyte in the sample	J
K1	Holding time violation	H
Ea	Estimated-Incubation temperature between 35.5 and 38.0° Celsius	
Er	Rejected-Incubation temperature < 34.5 or >38.0° Celsius	
PD1	Percent difference between duplicate samples excessive	
S1	Per SLD, uncertainties (sigmas) are expressed as one standard deviation, i.e. one standard error. Small negative or positive values that are less than two standard deviations should be interpreted as “less than the detection limit.”	
S2	Data are suspect but deemed usable based on best professional judgment; documentation of justification is required and should be included in the Data Verification and Validation Packet and reported with results	
Z1	Macroinvertebrate data did not meet QC criteria specified in Section 2.5 of QAPP	
H1	Habitat data did not meet QC criteria specified in Section 2.5 of QAPP	

Attachment 1.1 Water Quality Sample Data Verification and Validation Worksheet

Study Name: Compliance Monitoring Cooperative (CMC)
Year: FY 2018 (Sept 2017 – Wet Season Sample)
Project Coordinator: For Data Review and Reporting – SJG, BHI
V&V Reviewer: SJG
Data covered by this worksheet: Rio Grande South – 9/28/17
Version of Verification/Validation Procedures: QAPP – SOP #2 (2/2015)

Step 1: Verify Field Data

A. Are all Field Data forms present and complete? ☒ Yes ☐ No

If yes, proceed; if no, attempt to locate missing forms, then indicate any remaining missing forms and action taken.

Missing Field Data Forms	Action Taken
_____	_____
_____	_____

Total number of occurrences: 0

B. Are station name and ID, and sampling date and time on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station and Parameter	Action Taken	Re-verified?
_____	_____	_______
_____	_____	_______

Total number of occurrences: 0

C. Are field data on forms consistent with database? ☒ Yes ☐ No
If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify.

Station	Sampling Date	Parameter(s) Corrected	Re-verified?
_____	_____	_____	_______
_____	_____	_____	_______

Total number of occurrences: 0

D. Are RIDs correct and associated with the correct analytical suite, media subdivision (e.g. surface water, municipal waste, etc.) and activity type (e.g. Field observation, Routine sample, QA sample etc.)?
☒ Yes ☐ No

If yes, proceed; if no, indicate errors identified, correct errors in database and re-verify

Station/RID	Sampling Date	RID Corrected	Re-verified?
______	______	______	_________
______	______	______	_________

Total number of occurrences: 0

☒ **Step 1 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 2: Verify Data Deliverables
A. Have all data in question been delivered? ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing data (samples or blanks) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken. Complete this step upon receipt of all missing data.

RID	Submittal Date	Missing Data/Parameters	Date of Initial Verification	Date Missing Data Were Received
______	______	______	______	______
______	______	______	______	______

Total number of occurrences: 0

B. Do all of the analytical suites have the correct number and type of analytes. ☒ Yes ☐ No

If yes, proceed; if no, indicate RIDs with missing or incorrect analyte(s) or attach report with applicable RIDs highlighted. Contact data source and indicate action taken.
*Note – Lab report identifies “Dissolved Phosphorous” as “Total Phosphorous” on a filtered sample (identified under “Client Sample ID”).

RID	Submittal Date	Missing or Incorrect Parameters	Action Taken	Re-verified?
______	______	______	______	______
______	______	______	______	______

☒ **Step 2 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 3: Verify Flow Data
*Note – Not Applicable – no flow data provided with CMC sample collection
A. Identify incorrect or missing data on the flow calculation spreadsheet and correct errors.

Station	Sampling Date	Flow data missing or incorrect?
______	______	__________
______	______	__________

Total number of occurrences: 0

B. Identify incorrect or missing discharge measurements, correct errors in database and re-verify.

Station	Sampling Date	Flow data missing or incorrect?	Re-verified?
______	______	__________	__________
______	______	__________	__________

Total number of occurrences: 0

Not Applicable
☐ **Step 3 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 4: Verify Analytical Results for Missing Information or Questionable Results

Were any results with missing/questionable information identified? ☒ Yes ☐ No

If no, proceed; if yes, indicate results with missing information or questionable results or attach report. Contact data source and indicate action taken. Complete this step upon receipt of missing information or clarification of questionable results (clarify questionable results only, DO NOT change results without written approval (from lab or QA officer) and associated documentation).

RID	Sample Date	Missing or Questionable Information/Results	Action Taken
Rio Grande South	9/28/17	Lab report provides Dissolved Phosphorous results as "Total Phosphorous" for "filtered sample".	Notified AMAFCA of this and verified with HEAL. BHI added note to the lab report.

*Note – HEAL Lab report order number – 1709F81

Total number of occurrences: 1

☒ **Step 4 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 5: Validate Blanks Results

Were any analytes of concern detected in blank samples? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager, with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes have been added to database correctly.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database?*
_____	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged and include on *Validation Codes Form*.

Total number of occurrences: 0

☒ **Step 5 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 6: Validate Holding Times Violations

Were any samples submitted that did not meet specified holding times? ☐ Yes ☒ No

If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID	Sample Date	Parameter	[Blank]	[Sample]	Validation Code/Flag Applied	Code/Flag verified in database to ALL associated data?*
______	______	______	______	______		_________
______	______	______	______	______		_________

*See validation procedures to determine which associated data need to be flagged.
*Note – Lab reports lists pH with hold time flag. Database uses field data reported pH, so this is hold time is not applicable.
Total number of occurrences: 0

☒ **Step 6 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

- -

Step 7: Validate Replicate/Duplicate Results (if applicable)
Were any replicate/duplicate pairs submitted outside of the established control limit of 20%?
☐ Yes ☒ No
If no, proceed; if yes, list results that need to have validation codes applied in the database save these results as an excel file and forward to QA officer or Program Manager with a request to add appropriate validation codes to database. Complete this step after verifying that validation codes/flags have been added to database.

RID Pairs		Replicate or Duplicate?	Sample Date	Parameter	RPD	Validation Code/Flag Applied	Code/Flag verified in database applied?*
______	______	______	______	______	______		_________
______	______	______	______	______	______		_________

Total number of occurrences: 0

☒ **Step 7 Completed** ***Initials:*** SJG ***Date:*** 12/27/17

****

After all of the above steps have been completed, save and print the worksheet, attach all applicable supplemental information and sign below.

I acknowledge that the data verification and validation process has been completed for the data identified above in accordance with the procedures described in the CMC QAPP, SOP #2

12/27/17

Data Verifier/Validator Signature Date

COMPLETION OF DATA VERIFICATION AND VALIDATION PROCESS

Once the data verification and validation process has been completed for the entire study (note: if the worksheet is for a subset of the data from a study, be sure ALL the data for the entire study is included before final completion of the data verification and validation process), notify the NMSQUID administrator that the process is complete and request that “V V in STORET” be added to the project title.

Once all data have been verified and validated for a study provide copies of ALL *Data Verification and Validation Worksheets* and attachments associated with the study to the Quality Assurance Officer and retain originals in the project binder.

Attachment 1.2 SWQB Validation Codes

When deficiencies are identified through the data verification and validation process, AMAFCA documents or “flags” the deficiencies by assigning validation codes. All data collected from the last compliant QC sample and up to the next compliant QC sample are assigned validation codes. The validation code alerts the data user that the results are outside QA control limits and may require re-sampling or a separate, qualitative analysis based on professional judgment.

Validation Code	Definition	WQX Equivalent
A1	Sample not collected according to SOP	
B1	Chemical was detected in the field blank at a concentration less than 5% of the sample concentration.	
BN	Blanks NOT collected during sampling run	
BU	Detection in blank. Analyte was not detected in this sample above the method's sample detection limit.	BU
RB1	Chemical was detected in the field blank at a concentration greater than or equal to 5% of the sample concentration. Results for this sample are rejected because they may be the result of contamination; the results may not be reported or used for regulatory compliance purposes.	B
R1	Rejected due to incorrect sample preservation	R
R2	Rejected due to equipment failure in the field	R
R3	Rejected based on best professional judgment	R
D1	Spike recovery not within method acceptance limits	
F1	Sample filter time exceeded	
J1	Estimated: the analyte was positively identified and the associated value is an approximate concentration of the analyte in the sample	J
K1	Holding time violation	H
Ea	Estimated-Incubation temperature between 35.5 and 38.0° Celsius	
Er	Rejected-Incubation temperature < 34.5 or >38.0° Celsius	
PD1	Percent difference between duplicate samples excessive	
S1	Per SLD, uncertainties (sigmas) are expressed as one standard deviation, i.e. one standard error. Small negative or positive values that are less than two standard deviations should be interpreted as “less than the detection limit.”	
S2	Data are suspect but deemed usable based on best professional judgment; documentation of justification is required and should be included in the Data Verification and Validation Packet and reported with results	
Z1	Macroinvertebrate data did not meet QC criteria specified in Section 2.5 of QAPP	
H1	Habitat data did not meet QC criteria specified in Section 2.5 of QAPP	

ATTACHMENT 3

DOCUMENTATION FROM DBS&A RELATED TO SEPTEMBER 27-28, 2017, SAMPLE COLLECTION AND GROSS ALPHA ANALYTICAL RESULT

Bohannan ▲ Huston

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MEMORANDUM

DATE: July 3, 2018

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

FROM: Craig Hoover, PE
Sarah Ganley, PE

SUBJECT: **CMC Wet Season, Wet Weather Stormwater Monitoring Data Verification, Analysis Results Database, and Reporting FY 2018 Dry Season (November 1, 2017 to June 30, 2018) Task 28 Memo**

Notification of In-Stream Water Quality Exceedances

No CMC samples were able to be collected in the FY 2018 dry season (November 1, 2017 to June 30, 2018). Therefore, there are no in-stream water quality exceedances to report for the Compliance Monitoring Cooperative (CMC) monitoring program.

Overview of Stormwater Monitoring Activity

Bohannan Huston, Inc. (BHI) has been tasked to perform water quality services for the CMC Stormwater Data Verification, Database, and Reporting for the Wet Weather Stormwater Quality Monitoring Program for Fiscal Year (FY) 2018 (July 1, 2017 to June 30, 2018). 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 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 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 3 with at least three (3) events in the wet season and two (2) events in the dry season. Four (4) samples were collected in FY 2017 toward the WSB MS4 Permit requirements – three (3) in the wet season and one (1) in the dry season. In addition, two (2) samples were collected during the FY 2018 wet season (July 1, 2017 to October 31, 2017); reporting for these samples is in the February 2, 2018, CMC Wet Season, Wet Weather Stormwater Monitoring Memo. No CMC samples were able to be collected in the FY 2018 dry season (November 1, 2017 to June 30, 2018). Therefore, one (1) dry season storm event remains to be sampled by the CMC to meet WSB MS4 Permit requirements. The CMC samples obtained to date are summarized in Table 1 below:

Table 1: CMC Sample Summary
Compared to WSB MS4 Requirements

No. of Storm Events Required to Sample	CMC-WSB MS4 Permit Required Samples per Season	FY (Date) Sample Obtained at Rio Grande North and Rio Grande South
1	#1 Wet Season	FY 2017 (8/10/2016)
2	#2 Wet Season	FY 2017 (9/12/2016)
3	#3 Wet Season	FY 2017 (9/21/2016)
4	#1 Dry Season	FY 2017 (11/21/2016)
5	#2 Dry Season	Remaining Sample for CMC to Obtain
6	Any Season	FY 2018 (Wet Season - 7/27/2017)
7	Any Season	FY 2018 (Wet Season - 9/27/2017)

Stormwater Quality Database for CMC

As stated previously, there were no qualifying storm events sampled for the CMC during the FY 2018 dry season, wet weather monitoring. However, some details were added to the CMC Excel database regarding the Water Quality Criterion. This updated database is included with this memo.

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. For this Task, BHI has completed data entry related to the EPA CMC DMRs for the FY 2018 wet season. DMRs with this data are due to EPA on December 1, 2018, and these forms will be submitted to EPA by AMAFCA as the delegated data entry member for the CMC.

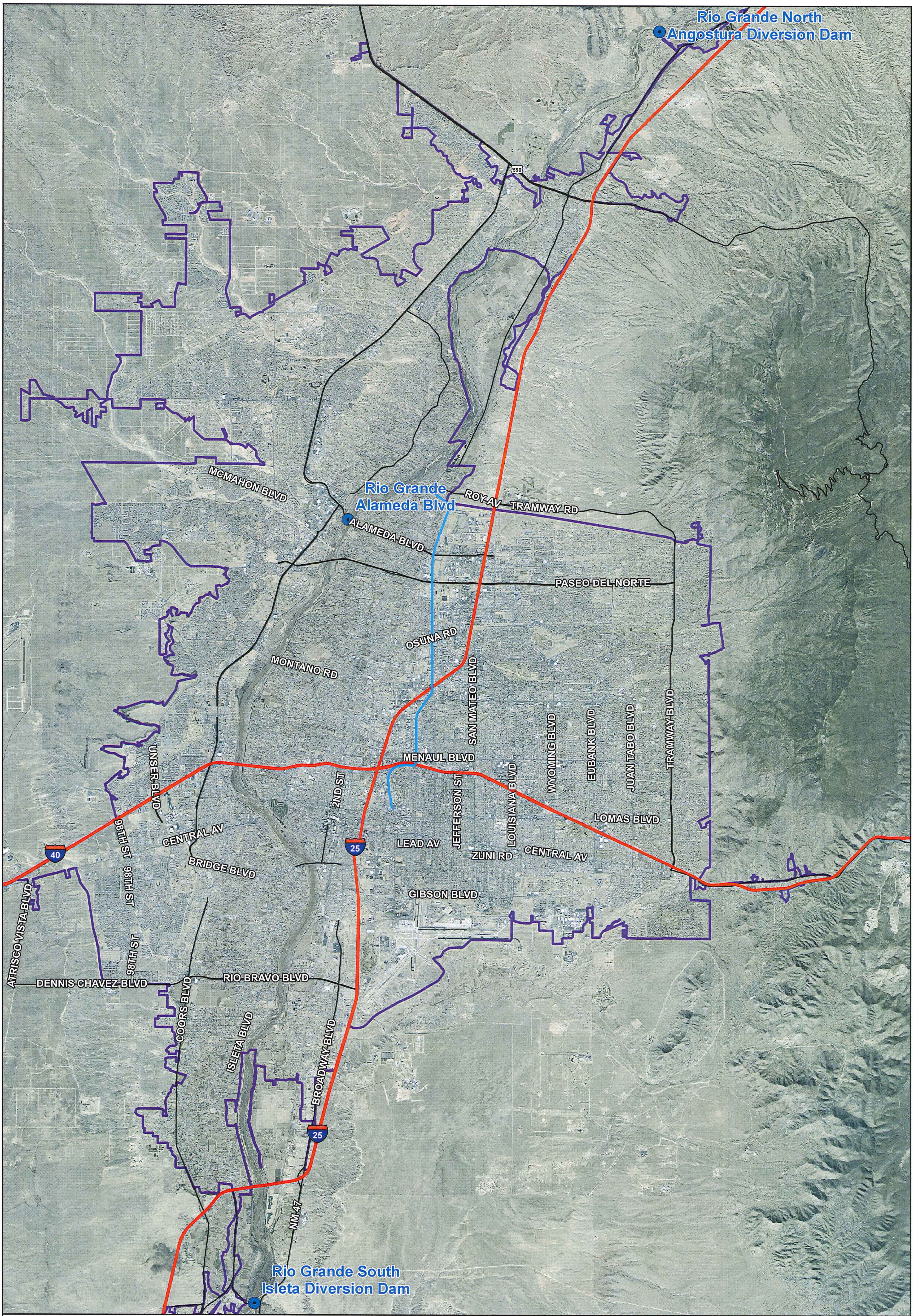
Conclusions and Planning

To summarize:

- With the two FY 2018 wet season samples, six (6) of the seven (7) required samples in the WSB MS4 Permit Wet Weather Monitoring section have been obtained. The CMC has met the required WSB MS4 Permit minimum of three (3) events during the wet season.
- Only one (1) dry season sample remains to be obtained to meet the WSB MS4 Permit requirements for the CMC members.

SG/le

Spreadsheet Included Separately: Excel CMC Spreadsheet updated with water quality criterion details.



AMAFCA

Legend

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

N W E S

0 0.5 1 2

Miles

CMC Monitoring

Figure 1
Monitoring Locations

Bohannan Huston
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P:\20180302\WR\Reports\Preliminary & Draft\Figures\MXDs\Figure1-CMCMonitoringLocations.mxd
Author: eburn

			NMAC 20.6.4 Water Quality Criterion		Isleta Pueblo Water Quality Criterion			
Parameter	Permit Required Units	MQLs - 2014 WSB Permit Appendix F	Basis (Rio Grande Basin - designated uses: irrigation, marginal warmwater aquatic life, livestock watering, public water supply, wildlife habitat, and primary contact)	Concentration	Isleta Pueblo (use- general stds. or use as defined for Rio Grande) based on 2005 EPA Approved, March 18, 2002 Amended Surface Water Quality Standards. Rio Grande uses: 1) warmwater fishery use, 2) primary contact ceremonial use, 3) primary contact recreational use, 4) agricultural water supply use, 5) industrial water supply use, and 6) wildlife usage	WQS Concentration	Sample Type	Analysis Method
Total Suspended Solids (TSS)	mg/L	--	Listed in general criteria, no numeric standard	--	Isleta (addressed turbidity, but no numeric criteria for TSS)	--	Composite	SM 2540D
Total Dissolved Solids (TDS)	mg/L	--	Rio Grande Basin (at mean monthly flows above 100 cfs)	1,500	Isleta (General Standards, Section III.K, p. 8 - increase of more than 1/3 over naturally occurring levels is not permitted)	This spreadsheet is not addressing this narrative standard	Composite	SM2540C MOD
Chemical Oxygen Demand (COD)	mg/L	--	--	--	--	--	Composite	EPA 410.4
Biochemical Oxygen Demand (BOD_5)	mg/L	--	--	--	--	--	Composite	SM5210B
Dissolved Oxygen (DO)	mg/L	--	Marginal Warmwater Aquatic	5	Isleta (Warmwater Fishery Use, p.10; General Standards, Section	5	Grab	FIELD
Oil and Grease (N-Hexane Extractable Material)	mg/L	--	Listed in general criteria, no numeric standard	--	Isleta (General Standards, guideline, Section III.B, p. 7, instantaneous maximum (15 mg/L) listed as WQS - there is also a weekly ave. max. of 10 mg/L WQS)	15	Grab	EPA 1664A
E. coli	MPN (CFU/100 mL)	--	Section 20.6.4.900.D Primary Contact-Single Sample. Geometric means values not used here for WQS comparison since typ. have only single sample. Geometric mean maximum = 126 CFU/100 ml.	410	Isleta (primary contact ceremonial use, p. 11; primary contact recreational use, p. 13). Based on single sample maximum. Geometric means values not used here for WQS comparison since typ. have only single sample. Geometric mean maximum = 47 CFU/100 ml.	88	Grab	SM 9223B Fecal Indicator
pH	S.U.	--	Primary Contact & Mar. Warmwater Aquatic	6.6 - 9	Isleta (6-9 range for warmwater fishery use, p. 10; 6.6-9 for primary contact recreational use, p. 13). Also have a narrative (p. 8) "The pH of a water body shall not be permitted to fluctuate in excess of 1.0 unit over a period of 24 hours for other than natural causes."	6.6-9	Grab	FIELD
Total Kjedahl Nitrogen (TKN)	mg/L	--	--	--	--	--	Composite	SM 4500
Nitrate plus Nitrite	mg/L	--	Livestock watering	132	--	--	Composite	EPA 300.0: Anions
Dissolved Phosphorous	mg/L	--	--	--	--	--	Composite	EPA 365.1, filtered sample
Ammonia (mg/L as N)	mg/L	--	Acute and chronic aquatic life criteria in the presence of fish early life stages, dependent on pH. See section 20.6.4.900.K and L	Need to look at Tables in NMAC 20.6.4.900.K & L. Need to check WQ flag by hand- not automated with equation	Isleta (Append. III, lookup tables based on pH and temperature). If any value reported, must look at tables. Chronic criteria should not be exceeded more than once in any three year period. Acute criteria more fitting for CMC sampling.	Need to look at Appendix III to determine WQS. Need to check WQ flag by hand- not automated with equation	Composite	SM 4500 NH3
Total Nitrogen	mg/L	--	--	--	Isleta (Section IV.D Primary Contact	10	Composite	--
Total Phosphorous	mg/L	--	--	--	--	--	Composite	EPA 365.1
PCBs (screening - used method 608)	µg/L	0.2	Wildlife Habitat & Aquatic Life (Chronic)=0.014 ug/L; Human health criteria = 0.00064 ug/L; DWS = 0.5 ug/L	0.00064	Isleta (Section IV.I Wildlife Usage, p. 13, PCBs = 74 ng/L = 0.074 ug/L; Append. II. Toxic Substances, pg. 26, Chronic toxicity = 0.014 ug/L and human health criteria = 0.17 ng/L=0.00017 ug/L)	0.00017	Composite	EPA 608
PCBS (Method 1668A - sum of all congeners)	µg/L	0.2	Wildlife Habitat & Aquatic Life (Chronic)=0.014 ug/L; Human health criteria = 0.00064 ug/L; DWS = 0.5 ug/L	0.00064	Isleta (Section IV.I Wildlife Usage, p. 13, PCBs = 74 ng/L = 0.074 ug/L; Append. II. Toxic Substances, pg. 26, Chronic toxicity = 0.014 ug/L and human health criteria = 0.17 ng/L=0.00017 ug/L)	0.00017	Grab	EPA 1668
Gross Alpha, Adjusted	pCi/L	N/A	DWS - Domestic Water Supply and LW - livestock watering	WQS = 15 Because of confidence reporting, need to check WQ flag by hand- not automated with equation.	Isleta (General Standards, Section III.I, pg. 8; listed as gross alpha (not adjusted))	WQS = 15 Because of confidence reporting, need to check WQ flag by hand- not automated with equation.	Composite	EPA 900.0
Tetrahydrofuran	µg/L	--	--	--	--	--	Composite	EPA 8260 C
Benzo[a]pyrene	µg/L	5	DWS - Domestic Water Supply (0.2 ug/L) Aquatic Life HH-OO (0.18 ug/L)	0.18	--	--	Composite	EPA 625
Benzo[b]fluoranthene (other name: 3,4-Benzofluoranthene)	µg/L	10	DWS - Domestic Water Supply	0.048	--	--	Composite	EPA 625
Benzo[k]fluoranthene	µg/L	5	DWS - Domestic Water Supply	0.048	--	--	Composite	EPA 625
Chrysene	µg/L	5	DWS - Domestic Water Supply	0.048	--	--	Composite	EPA 625
Indeno(1,2,3-cd)Pyrene	µg/L	5	DWS - Domestic Water Supply	0.048	--	--	Composite	EPA 625
Dieldrin	µg/L	0.02	DWS - Domestic Water Supply HH-OO	0.022 0.00054	--	--	Composite	EPA 608
Pentachlorophenol	µg/L	5	DWS - Domestic Water Supply Aquatic Life (acute / chronic)[1]	1 19/15	Isleta (odor & taste, general stds, Section III.D, pg. 7 and Appendix I)	30	Composite	EPA 625
Benzidine	µg/L	50	DWS - Domestic Water Supply	0.0015	--	--	Composite	EPA 625
Benzo[a]anthracene	µg/L	5	DWS - Domestic Water Supply	0.048	--	--	Composite	EPA 625
Dibenzofuran	µg/L	--	--	--	--	--	Composite	EPA 625
Dibenz[a,h]anthracene	µg/L	5	DWS - Domestic Water Supply	0.048	--	--	Composite	EPA 625
Chromium VI (Hexavalent)	µg/L	10	Aquatic Life (acute / chronic)[1]	16 / 11	Isleta - only dissolved Chromium listed, not Chromium VI	--	Composite	3500Cr C-2011
Dissolved Copper	µg/L	0.5	Aquatic Life (acute / chronic)[1] Toxicity Equations based on hardness. WQS Criteria uses lookup table based on hardness. Irrigation	12 / 8 (Acute / Chronic) values listed here are based on a hardness of 90 mg/L - actual WQS is hardness dependent. 200	Appendix II has Aquatic Life Acute and Chronic Toxicity Equations based on hardness - very similar to NM WQSs. WQS Criteria uses lookup table based on hardness. Isleta (Agricultural Use, p. 13 - livestock - listed as 0.5 mg/L in WQS - converted to ug/L units to match reporting). Also total copper criteria listed in Appendix I (not applicable).	12.2 / 8.2 (Acute / Chronic) values listed here are based on a hardness of 90 mg/L - actual WQS is hardness dependent 500	Composite	EPA 200.8
Dissolved Lead	µg/L	0.5	Aquatic Life (acute / chronic)[1] Toxicity Equations based on hardness. WQS Criteria uses lookup table based on hardness. DWS - Domestic Water Supply	58 / 2 (Acute / Chronic) values listed here are based on a hardness of 90 mg/L - actual WQS is hardness dependent. 15	Isleta (Append. II, Toxic Substances, pg. 23, Chronic and Acute toxicity eqns. dependent on hardness) - check lookup table for any reported values	51/2 (Acute / Chronic) values listed here are based on a hardness of 90 mg/L - actual WQS is hardness dependent.	Composite	EPA 200.8
Bis (2-ethylhexyl) Phthalate (other names: Di(2-	µg/L	10	DWS - Domestic Water Supply	6	Isleta (Append. II, Toxic Substances, pg. 25)	5.9	Composite	EPA 625
Conductivity	umhos/cm	--	--	--	--	--	Grab	FIELD
Temperature	°C	--	Marginal Warmwater Aquatic	32.2 max	Isleta (General Standards Section III.J, pg. 8; Section IV.C,	32.2 max	Grab	FIELD
Hardness (as $CaCO_3$)	mg/L	--	--	--	--	--	Grab	SM2340B

	Rio Grande - North																			
Parameter	Provisional or Verified	NORTH Collection Date 8/02/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	NORTH Collection Date 8/03/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 1 NORTH Collection Date 8/10-8/11/16 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	NORTH Collection Date 8/31/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	NORTH Collection Date 9/07/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion
Total Suspended Solids (TSS)									V	41		--								
Total Dissolved Solids (TDS)									V	230	D	OK								
Chemical Oxygen Demand (COD)									V	16.2		--								
Biochemical Oxygen Demand (BOD_5)									V	<2.0		--								
Dissolved Oxygen (DO)	V	5.89		OK	V	5.8		OK	V	7.18		OK	V	7.06		OK	V	7.29		OK
Oil and Grease (N-Hexane Extractable Material)									V	ND		OK								
E. coli	V	28		OK	V	185		>WQ Standard	V	36		OK	V	88		>WQ Standard	V	82		OK
pH	V	8.05		OK	V	8.6		OK	V	8.73		OK	V	9		OK	V	8.07		OK
Total Kjedahl Nitrogen (TKN)									V	ND		--								
Nitrate plus Nitrite									V	ND		OK								
Dissolved Phosphorous									V	0.03		--								
Ammonia (mg/L as N)									V	ND		OK								
Total Nitrogen									V	ND		OK								
Total Phosphorous									V	0.081		--								
PCBs (screening - used method 608)									V	ND	Screening Method	OK								
PCBS (Method 1668A - sum of all congeners)																				
Gross Alpha, Adjusted									V	3.72 ± 1.97		OK								
Tetrahydrofuran									V	ND		--								
Benzo[a]pyrene									V	ND		OK								
Benzo[b]fluoranthene (other name: 3,4-Benzofluoranthene)									V	ND		OK								
Benzo[k]fluoranthene									V	ND		OK								
Chrysene									V	ND		OK								
Indeno(1,2,3-cd)Pyrene									V	ND		OK								
Dieldrin									V	ND		OK								
Pentachlorophenol									V	ND		OK								
Benzidine									V	ND		OK								
Benzo[a]anthracene									V	ND		OK								
Dibenzofuran									V	ND		--								
Dibenz[a,h]anthracene									V	ND		OK								
Chromium VI (Hexavalent)									V	ND		OK								
Dissolved Copper									V	1.2		OK								
Dissolved Lead									V	ND		OK								
Bis (2-ethylhexyl) Phthalate									V	ND		OK								
Conductivity	V	256		--	V	270		--	V	280		--	V	305		--	V	319		--
Temperature	V	24.15		OK	V	23.67		OK	V	22.8		OK	V	21.18		OK	V	21.19		OK
Hardness (as $CaCO_3$)									V	110		--								

Parameter	Provisional or Verified	CMC SAMPLE 2 NORTH Collection Date 9/12-9/13/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 3 NORTH Collection Date 9/21-9/22/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	NORTH Collection Date 11/03/2016 Dry Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 4 NORTH Collection Date 11/21/2016 Dry Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 5 NORTH Collection Date 7/27/17 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 6 NORTH Collection Date 9/27/17 Wet Season Sample	Qualifier
Total Suspended Solids (TSS)	V	29		--	V	26		--					V	27		--	V	32		--	V	260	D
Total Dissolved Solids (TDS)	V	201		OK	V	215		OK					V	213		OK	V	181		OK	V	225	D
Chemical Oxygen Demand (COD)	V	12.3		--	V	8.49		--					V	16.4		--	V	19.9		--	V	20.5	
Biochemical Oxygen Demand (BOD_5)	V	<2.0		--	V	<2.0		--					V	<2		--	V	<2.0		--	V	2	
Dissolved Oxygen (DO)	V	6.24		OK	V	7.14		OK	V	8.57		OK	V	10.62		OK	V	6.73		OK	V	7.13	
Oil and Grease (N-Hexane Extractable Material)	V	ND		OK	V	ND		OK					V	ND		OK	V	5.17	J	OK	V	ND	
E. coli	V	56		OK	V	31		OK	V	42		OK	V	44		OK	V	20.0		OK	V	733	
pH	V	8.53		OK	V	8.96		OK	V	8.01		OK	V	8.4		OK	V	7.37		OK	V	7.83	
Total Kjedahl Nitrogen (TKN)	V	ND		--	V	ND		--					V	ND		--	V	ND		--	V	0.84	J
Nitrate plus Nitrite	V	ND		OK	V	ND		OK					V	ND		OK	V	0.05	J	OK	V	0.2	J
Dissolved Phosphorous	V	0.018		--	V	0.016		--					V	0.012		--	V	0.025		--	V	0.029	
Ammonia (mg/L as N)	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Total Nitrogen	V	ND		OK	V	ND		OK					V	ND		OK	V	0.05	J	OK	V	1.04	J
Total Phosphorous	V	0.052		--	V	0.042		--					V	0.042		--	V	0.062		--	V	0.28	D
PCBs (screening - used method 608)	V	ND	screening method	OK	V	ND	screening method	OK															
PCBS (Method 1668A - sum of all congeners)	V	0.00144		>WQ Standard	V	0.00146		>WQ Standard					V	0.0000611		OK	P	0.000127	U	OK	V	0.00021	
Gross Alpha, Adjusted	V	2.32 ± 1.47		OK	V	5.68 ± 2.38		OK					V	3.11 ± 0.884		OK	V	2.06 ± 1.6		OK	V	2.91 ± NA	
Tetrahydrofuran	V	ND		--	V	ND		--					V	ND		--	V	ND	not reported. Special note in lab report	--	V	ND	
Benzo[a]pyrene	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Benzo[b]fluoranthene (other name: 3,4-Benzofluoranthene)	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Benzo[k]fluoranthene	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Chrysene	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Indeno(1,2,3-cd)Pyrene	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Dieldrin	V	ND		OK	V	ND		OK					V	ND		OK	V	ND	not reported. Special note in lab report	OK	V	ND	
Pentachlorophenol	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Benzidine	V	ND		OK	V	ND		OK					V	ND		OK	V	ND	not reported. Special note in lab report	OK	V	ND	
Benzo[a]anthracene	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Dibenzofuran	V	ND		--	V	ND		--					V	ND		--	V	ND		--	V	ND	
Dibenz[a,h]anthracene	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Chromium VI (Hexavalent)	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Dissolved Copper	V	2.4		OK	V	1.3		OK					V	ND		OK	V	1.1		OK	V	0.95	J
Dissolved Lead	V	ND		OK	V	ND		OK					V	ND		OK	V	ND		OK	V	ND	
Bis (2-ethylhexyl) Phthalate	V	ND		OK	V	ND		OK					V	ND		OK	V	5.5	J	OK	V	3.06	
Conductivity	V	318		--	V	298		--	V	320		--	V	305		--	V	247		--	V	103.4	
Temperature	V	20.01		OK	V	20.99		OK	V	14.6		OK	V	10.36		OK	V	23.47		OK	V	16.3	
Hardness (as $CaCO_3$)	V	130		--	V	130		--					V	130		--	V	110		--	V	140	

Data Verification/Validation and Qualifier Notes:

(R) The sample results are unusable because certain criteria were not met. The analyte may or may not be present in the sample.
(H) Sample holding time exceeded.
(J) The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
(D) Sample was diluted by Lab due to matrix
(U) Analyte was analyzed for, but not detected above the specified detection limit.

Notes:

	Rio Grande - South							
Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 1 SOUTH Collection Date 8/11/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion	Provisional or Verified	CMC SAMPLE 2 SOUTH Collection Date 9/13/2016 Wet Season Sample	Qualifier	Check compared to Water Quality Criterion
--	V	330		--	V	130		--
OK	V	305	D	OK	V	288	D	OK
--	V	17		--	V	18.6		--
--	V	<2.0		--	V	<2.0		--
OK	V	5.33		OK	V	6.32		OK
OK	V	ND		OK	V	ND		OK
>WQ Standard	V	1,106		>WQ Standard	V	959		>WQ Standard
OK	V	8.7		OK	V	8.45		OK
--	V	ND	D	--	V	ND		--
OK	V	ND		OK	V	0.83		OK
--	V	0.17		--	V	0.5		--
OK	V	ND	D	OK	V	ND		OK
OK	V	< 2		OK	V	ND		OK
--	V	0.38		--	V	0.65		--
	V	ND	Screening Method	OK	V	ND	screening method	OK
>WQ Standard					V	0.00272		>WQ Standard
OK	V	10.6 ± 3.61		OK	V	6.16 ± 2.62		OK
--	V	ND		--	V	ND		--
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
--	V	ND		--	V	ND		--
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
OK	V	1.2		OK	V	1.6		OK
OK	V	ND		OK	V	ND		OK
OK	V	ND		OK	V	ND		OK
--	V	326		--	V	412		--
OK	V	24.9		OK	V	18.7		OK
--	V	130		--	V	150		--

CMC Water Quality Results Database
FY 2017
Date: Nov. 29, 2017
DMR 001-W, 001-WA, 001-WB - signed and certified in CDX system on 11/29/17

		Rio Grande North				Rio Grande South						
DMR Form Parameter	Database Parameter Name (for lookup)	CMC SAMPLE 1 NORTH Collection Date 8/10-8/11/16 Wet Season Sample	CMC SAMPLE 2 NORTH Collection Date 9/12-9/13/2016 Wet Season Sample	CMC SAMPLE 3 NORTH Collection Date 9/21-9/22/2016 Wet Season Sample	CMC SAMPLE 4 NORTH Collection Date 11/21/2016 Dry Season Sample	CMC SAMPLE 1 SOUTH Collection Date 8/11/2016 Wet Season Sample	CMC SAMPLE 2 SOUTH Collection Date 9/13/2016 Wet Season Sample	CMC SAMPLE 3 SOUTH Collection Date 9/22/2016 Wet Season Sample	CMC SAMPLE 4 SOUTH Collection Date 11/22/2016 Dry Season Sample	Units	Unit Check	
		DMR 001-W	DMR 001-WA	DMR 001-WB	DMR 001-D	DMR 002-W	DMR 002-WA	DMR 002-WB	DMR 002-D			
Temperature, water deg. Centigrade	Temperature	22.8	20.01	20.99	10.36	24.9	18.7	22.03	9.3	deg C	°C	
Conductivity	Conductivity	280	318	298	305	326	412	436	367	umho/cm	umhos/cm	
Oxygen, dissolved [DO]	Dissolved Oxygen (DO)	7.18	6.24	7.14	10.62	5.33	6.32	8.29	8.01	mg/L	mg/L	
BOD, 5-day, 20 deg. C	Biochemical Oxygen Demand (BOD_5)	<2.0	<2.0	<2.0	<2	<2.0	<2.0	<2.0	3	mg/L	mg/L	
Oxygen demand, chem. [high level] [COD]	Chemical Oxygen Demand (COD)	16.2	12.3	8.49	16.4	17	18.6	10.6	23.1	mg/L	mg/L	
pH	pH	8.73	8.53	8.96	8.4	8.7	8.45	9	8.08	SU	S.U.	
Solids, total suspended	Total Suspended Solids (TSS)	41	29	26	27	330	130	60	340	mg/L	mg/L	
Oil & Grease	Oil and Grease (N-Hexane Extractable Material)	ND	ND	ND	ND	ND	ND	ND	ND	mg/L	mg/L	
Nitrogen, Kjedahl, total [as N]	Total Kjedahl Nitrogen (TKN)	ND	ND	ND	ND	ND	ND	ND	2.2	mg/L	mg/L	
Nitrite + Nitrate total [as N]	Nitrate plus Nitrite	ND	ND	ND	ND	ND	0.83	0.95	0.68	mg/L	mg/L	
Phosphorus, total [as P]	Total Phosphorous	0.081	0.052	0.042	0.042	0.38	0.65	0.42	0.55	mg/L	mg/L	
Phosphorus, dissolved	Dissolved Phosphorous	0.03	0.018	0.016	0.012	0.17	0.5	0.32	0.3	mg/L	mg/L	
Chromium, hexavalent [as Cr]	Chromium VI (Hexavalent)	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Copper, dissolved [as Cu]	Dissolved Copper	1.2	2.4	1.3	ND	1.2	1.6	1.2	ND	ug/L	µg/L	
Lead, dissolved [as Pb]	Dissolved Lead	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Benzo[b]fluoranthene	Benzo[b]fluoranthene (other name: 3,4-Benzofluoranthene)	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Benzo[k]fluoranthene	Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Benzo[a]pyrene	Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Chrysene	Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Indeno[1,2,3-cd]pyrene	Indeno(1,2,3-cd)Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Benzo[a]anthracene	Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Dibenz[a,h]anthracene	Dibenz(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Pentachlorophenol	Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Di[2-ethylhexyl]phthalate [DEHP]	Bis (2-ethyhexyl) Phthalate (other names: Di(2-ethylhexly)phthalate, DEHP)	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Benzidine	Benzidine	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Dieldrin	Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Polychlorinated biphenyls [PCBs] - *DMR units in mg/L - CMC Database and Lab Reports units in ug/L*	PCBs (screening - used method 608)	ND			0	ND				ug/L	µg/L	
	PCBS (Method 1668A - sum of all congeners)		0.0000014	0.0000015	0.0000001		0.0000027	0.0000022	0.0000017	ug/L	µg/L	Entry in DMR defaults to 7 decimal spaces
E. coli	E. coli	35.9	55.6	31.1	43.5	1106	959	517.2	7270	CFU/100mL	MPN (CFU/100 mL)	
Solids, total dissolved	Total Dissolved Solids (TDS)	230	201	215	213	305	288	301	248	mg/L	mg/L	
Alpha gross radioactivity	Gross Alpha, Adjusted	3.72 ± 1.97	2.32 ± 1.47	5.68 ± 2.38	3.11 ± 0.884	10.6 ± 3.61	6.16 ± 2.62	2.25 ± 1.6	7.26 ± 1.94	pCi/L	pCi/L	
Dibenzofuran	Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	
Tetrahydrofuran	Tetrahydrofuran	ND	ND	ND	ND	ND	ND	ND	ND	ug/L	µg/L	

CMC Water Quality Results Database
FY 2018
Date: March 29, 2018
Data checked, entered into DMRs on 3/29/18 and se

DMR Form Parameter
Temperature, water deg. Centigrade
Conductivity
Oxygen, dissolved [DO]
BOD, 5-day, 20 deg. C
Oxygen demand, chem. [high level] [COD]
pH
Solids, total suspended
Oil & Grease
Nitrogen, Kjedahl, total [as N]
Nitrite + Nitrate total [as N]
Phosphorus, total [as P]
Phosphorus, dissolved
Chromium, hexavalent [as Cr]
Copper, dissolved [as Cu]
Lead, dissolved [as Pb]
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[a]pyrene
Chrysene
Indeno[1,2,3-cd]pyrene
Benzo[a]anthracene
Dibenz[a,h]anthracene
Pentachlorophenol
Di[2-ethylhexyl]phthalate [DEHP]
Benzidine
Dieldrin

Polychlorinated biphenyls [PCBs] - *DMR units in mg/L - CMC Database and Lab Reports units in ug/L conversion of 1/1000 applied here - DMR limits to 7 decimal places*
E. coli
Solids, total dissolved
Alpha gross radioactivity
Dibenzofuran
Tetrahydrofuran

ent to AMAFCA to sign

	Rio Grande North		Rio Grande South
Database Parameter Name (for lookup)	CMC SAMPLE 5 NORTH Collection Date 7/27/17 Wet Season Sample	CMC SAMPLE 6 NORTH Collection Date 9/27/17 Wet Season Sample	CMC SAMPLE 5 SOUTH Collection Date 7/27/2017 Wet Season Sample
Temperature	23.47	16.3	23.6
Conductivity	247	103.4	361
Dissolved Oxygen (DO)	6.73	7.13	6.8
Biochemical Oxygen Demand (BOD_5)	<2.0	2	2
Chemical Oxygen Demand (COD)	19.9	20.5	15
pH	7.37	7.83	8.13
Total Suspended Solids (TSS)	32	260	63
Oil and Grease (N-Hexane Extractable Material)	5.17	ND	3.7
Total Kjedahl Nitrogen (TKN)	ND	0.84	0.84
Nitrate plus Nitrite	0.05	0.2	0.88
Total Phosphorous	0.062	0.28	0.33
Dissolved Phosphorous	0.025	0.029	0.25
Chromium VI (Hexavalent)	ND	ND	ND
Dissolved Copper	1.1	0.95	1.2
Dissolved Lead	ND	ND	ND
Benzo[b]fluoranthene (other name: 3,4-Benzofluoranthene)	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND
Chrysene	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND
Pentachlorophenol	ND	ND	ND
Bis (2-ethyhexyl) Phthalate (other names: Di(2-ethylhexly)phthalate, DEHP)	5.5	3.06	ND
Benzidine	ND	ND	ND
Dieldrin	ND	ND	ND

PCBs (screening - used method 608)			
PCBS (Method 1668A - sum of all congeners)	0.0000001	0.0000002	0.0000002
E. coli	20	733	235.9
Total Dissolved Solids (TDS)	181	225	248.0
Gross Alpha, Adjusted	2.06 ± 1.6	2.91 ± NA	2.15 ± 1.31
Dibenzofuran	ND	ND	ND
Tetrahydrofuran	ND	ND	ND

CMC SAMPLE 6 SOUTH Collection Date 9/27/2017 Wet Season Sample	Units
15.2	deg C
192.2	umho/cm
7.23	mg/L
5	mg/L
36.2	mg/L
7.92	SU
810	mg/L
ND	mg/L
1.7	mg/L
0.46	mg/L
0.74	mg/L
0.08	mg/L
ND	ug/L
0.98	ug/L
0.47	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L
ND	ug/L

0.0000010	mg/L
6131	CFU/100mL
260	mg/L
20.9 ± NA	pCi/L
ND	ug/L
ND	ug/L

Entry in DMR defaults to 7 decimal spaces

NM WQ standards - lookup tables

Hardness Dependent Acute and Chronic Aquatic Life Criteria for Metals

Copper (Cu) - NMAC 20.6.4.900.I(3)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	4	3
30	4	3
40	6	4
50	7	5
60	8	6
70	10	7
80	11	7
90	12	8
100	13	9
200	26	16
300	38	23
400	50	29

Sandia

Copper (Cu)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	3.6	2.7
30	4.3	3.2
40	5.7	4.1
50	7.0	5.0
60	8.3	5.8
70	9.6	6.6
80	10.9	7.4
90	12.2	8.2
100	13.4	9.0
200	25.8	16.2
300	37.8	22.9
400	49.6	29.3

Cadmium (Cd) - NMAC 20.6.4.900.I(3)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	0.51	0.17
30	0.59	0.19
40	0.76	0.23
50	0.91	0.28
60	1.07	0.31
70	1.22	0.35
80	1.37	0.39
90	1.51	0.42
100	1.65	0.45
200	2.98	0.75
300	4.21	1
400	5.38	1.22

Cadmium (Cd)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	0.52	0.09
30	0.62	0.11
40	0.83	0.13
50	1.03	0.15
60	1.23	0.17
70	1.42	0.19
80	1.62	0.21
90	1.82	0.23
100	2.01	0.25
200	3.95	0.40
300	5.85	0.53
400	7.74	0.64

Aluminum (Al) - NMAC 20.6.4.900.I(3)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	512	205

Chromium (III)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	183.1	23.8

30	658	263
40	975	391
50	1324	530
60	1699	681
70	2099	841
80	2520	1010
90	2961	1186
100	3421	1370
200	8838	3541
220	10071	4035
400	10071	4035

For aluminum, the criteria are based on analysis of total recoverable aluminum in a sample that is filtered to minimize mineral phases as specified by the d

30	212.6	27.6
40	269.0	35.0
50	323.0	42.0
60	375.0	48.8
70	425.4	55.3
80	474.6	61.7
90	522.7	68.0
100	569.8	74.1
200	1005.2	130.8
300	1401.1	182.3
400	1773.3	230.7

Lead (Pb)		
Hardness as $CaCO_3$ dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	14.01	0.53
30	17.53	0.66
40	24.98	0.94
50	32.87	1.23
60	41.14	1.54
70	49.72	1.87
80	58.59	2.20
90	67.71	2.54
100	77.07	2.89
200	180.54	6.77
300	296.89	11.12
400	422.46	15.81

Zinc (Zn)		
Hardness as $CaCO_3$ dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	36.2	36.5
30	42.3	42.6
40	53.9	54.4
50	65.1	65.7
60	76.0	76.6
70	86.6	87.3
80	97.0	97.8
90	107.2	108.0
100	117.2	118.1
200	210.8	212.5
300	297.3	299.7
400	379.3	382.4

Isleta

Copper (Cu)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	3.6	2.7
30	4.3	3.2
40	5.7	4.1
50	7.0	5.0
60	8.3	5.8
70	9.6	6.6
80	10.9	7.4
90	12.2	8.2
100	13.4	9.0
200	25.8	16.2
300	37.8	22.9
400	49.6	29.3

CF Acute	CF Chronic
1.00	0.97
0.99	0.96
0.98	0.95
0.97	0.94
0.97	0.93
0.96	0.92
0.95	0.92
0.95	0.91
0.94	0.91
0.92	0.88
0.90	0.86
0.89	0.85

Cadmium (Cd)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	0.51	0.09
30	0.61	0.10
40	0.82	0.13
50	1.03	0.15
60	1.23	0.17
70	1.44	0.19
80	1.65	0.22
90	1.86	0.23
100	2.08	0.25
200	4.20	0.42
300	6.34	0.57
400	8.50	0.71

Chromium (III)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	183.1	23.8

30	212.5	27.6
40	269.0	35.0
50	323.0	42.0
60	375.0	48.8
70	425.4	55.3
80	474.6	61.7
90	522.7	68.0
100	569.8	74.1
200	1005.2	130.8
300	1401.1	182.2
400	1773.3	230.7

		Lead (Pb)				
CF Acute	CF Chronic	Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)	CF Acute	CF Chronic
1.00	0.97	25	13.88	0.54	0.99	0.99
0.99	0.96	30	17.04	0.66	0.97	0.97
0.98	0.95	40	23.51	0.92	0.92	0.92
0.97	0.94	50	30.14	1.17	0.89	0.89
0.97	0.93	60	36.88	1.44	0.87	0.87
0.96	0.92	70	43.71	1.70	0.84	0.84
0.95	0.92	80	50.61	1.97	0.82	0.82
0.95	0.91	90	57.57	2.24	0.81	0.81
0.94	0.91	100	64.58	2.52	0.79	0.79
0.92	0.88	200	136.14	5.31	0.69	0.69
0.90	0.86	300	208.58	8.13	0.63	0.63
0.89	0.85	400	280.85	10.94	0.59	0.59

Zinc (Zn)		
Hardness as CaCO3 dissolved (mg/L)	Acute (ug/L)	Chronic (ug/L)
25	36.2	36.5
30	42.3	42.6
40	53.9	54.4
50	65.1	65.7
60	76.0	76.6
70	86.6	87.3
80	97.0	97.8
90	107.2	108.0
100	117.2	118.1
200	210.8	212.5
300	297.3	299.7
400	379.3	382.4

Ammonia - WQS

Freshwater acute aquatic life criteria for total (unfiltered) ammonia are expressed as a function of pH and the presence or absence of salmonids; values displayed correspond to a pH of 7.8 and absence of salmonids based on the overall median and average pH and absence of salmonids at the outfalls. Freshwater chronic aquatic life criteria for total ammonia are expressed as a function of pH and water temperature in the water body; values displayed correspond to a pH of 7.8 and temperature greater than 15 degrees Celsius based on the overall median and average pH and temperature values at the outfalls;

NMAC - water quality standard for ammonia, unfiltered, as N

Acute criteria - use table below - Chronic (if there are multiple samples per month) - there are various tables and f

K. Acute aquatic life criteria for total ammonia are dependent on pH and the pr criteria in mg/L as N based on analysis of unfiltered samples are as follows:

pH	Where Salmonids Present	Where Salmonid
6.5 and below	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0 and above	0.885	1.32

L. Chronic aquatic life criteria for total ammonia are dependent on pH, temperature and whether fish in e: are present or absent. The criteria are based on analysis of unfiltered samples and are calculated according to the equation Paragraphs (1) and (2) of this subsection. For temperatures from below 0 to 14°C, the criteria for 14°C apply; for tempera

Paragraphs (1) and (2) of this subsection. For temperatures from below 0 to 14°C, the criteria for 14°C apply; for tempera
30°C, the criteria for 30°C apply. For pH values below 6.5, the criteria for 6.5 apply; for pH values above 9.0, the criteria

(1) Chronic aquatic life criteria for total ammonia when fish early life stages are present:

(a) The equation to calculate chronic criteria in mg/L as N is:

$$((0.0577/(1 + 10^{7.688-pH})) + (2.487/(1 + 10^{pH-7.688})) \text{ x MIN } (2.85, 1.45 \text{ x } 10^{0.028 \text{ x } (25-T)})$$

(b) Selected values of calculated chronic criteria in mg/L as N:

pH	Temperature (°C)									
	14 and below	15	16	18	20	22	24	26	28	30 and above
6.5 and below	6.67	6.46	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.36	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.25	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.10	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	5.93	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.73	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18

pH	Temperature (°C)									
	14 and below	15	16	18	20	22	24	26	28	30 and above
7.1	5.67	5.49	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.22	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	4.92	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.59	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.23	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.85	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.47	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.09	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.71	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.36	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.03	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.74	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.48	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.25	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.06	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.892	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.754	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.641	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.548	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0 and above	0.486	0.471	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

(2) Chronic aquatic life criteria for total ammonia when fish early life stages are absent.

(a) The equation to calculate chronic criteria in mg/L as N is:

$$((0.0577/(1 + 10^{7.688-pH})) + (2.487/(1 + 10^{pH-7.688})) \text{ x } 1.45 \text{ x } 10^{0.028 \text{ x } (25-MAX(T,7))}$$

(b) Selected values of calculated chronic criteria in mg/L as N:

pH	Temperature (°C)								
	7 and below	8	9	10	11	12	13	14	15 and above
6.5 and below	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754
8.8	1.07	1.01	0.944	0.855	0.829	0.778	0.729	0.684	0.641
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548
9.0 and above	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471

pH	**Temperature (°C)**								
	7 and below	8	9	10	11	12	13	14	15 and above
At 15°C and above, the criterion for fish early life stages absent is the same as the criterion for fish early life stages present (refer to table in Paragraph (1) of this subsection).									

[20.6.4.900 NMAC - Rp 20 NMAC 6.1.3100, 10-12-2000; A, 10-11-2002; A, 05-23-2005; A, 07-17-2005; A, 12-01-2010; A, 03-02-2017]

Isleta WQS
Chronic Criterion is not to be exceeded more
ish stages to consider.
For WQSs with CMC - will be looking at acute

APPENDIX III. C.

esence or absence of salmonids. The

s Absent

TOTAL AMMONIA, ACU	
pH	COLDWATER DESIG WATER BODY
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.1
6.9	26.2
7.0	24.1
7.1	22.0
7.2	19.7
7.3	17.5
7.4	15.4
7.5	13.3
7.6	11.4
7.7	9.65
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

arly life stages
s in

APPEND

ures above
for 9.0 apply.

than once in a three year period.
criteria

TE CRITERIA , (mg Nitrogen/L)	
NATED	WARMWATER DESIGNATED WATER BODY
	48.8
	46.8
	44.6
	42.0
	39.1
	36.1
	32.8
	29.5
	26.2
	23.0
	19.9
	17.0
	14.4
	12.1
	10.1
	8.40
	6.95
	5.72
	4.71
	3.88
	3.20
	2.65
	2.20
	1.84
	1.56
	1.32

CMC Monitoring - E. coli Results

CMC E. coli Data Comparisons

FY 2017 - Wet Season[1] - E. coli Results (CFU/100 mL) in the Rio Grande - North and South of the Middle Rio Grand						
	Date					
	Not A Qualifying Storm Event	Not A Qualifying Storm Event		Not A Qualifying Storm Event	Not A Qualifying Storm Event	
Location in Rio Grande	8/2/16	8/3/16	8/10/16	8/31/16	9/7/16	9/12/16
Rio Grande North	28.1	185.0	35.9	88.2	82.0	55.6
Rio Grande South			1,106.0			959.0

[1]Wet season defined in MS4 Permit NMR04A000 as July 1 through October 31

FY 2017 - Dry Season[1] - E. coli Results (CFU/100 mL) in the Rio Grande - North and South of the Middle Rio Granc						
	Date					
	Not A Qualifying Storm Event					
Location in Rio Grande	11/3/16	11/21/16				
Rio Grande North	42.0	43.5				
Rio Grande South		7,270				

[1]Dry season defined in MS4 Permit NMR04A000 as November 1 through June 30

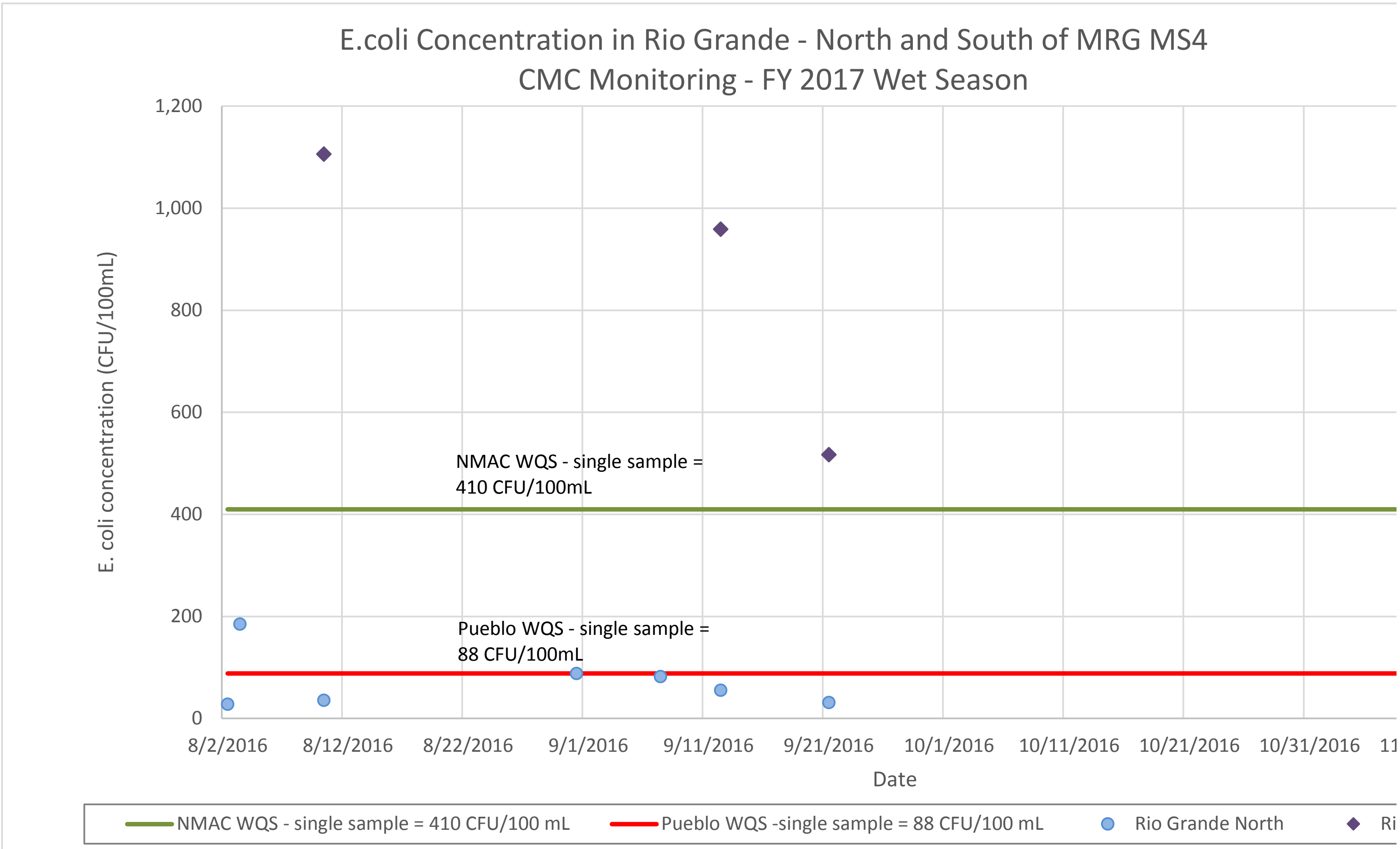
CMC Monitoring - E. coli Results

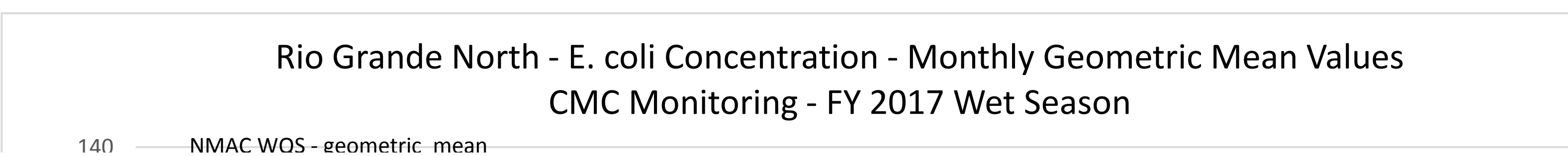
FY 2018 - Wet Season[1] - E. coli Results (CFU/100 mL) in the Rio Grande - North and South of the Middle Rio Grand						
Location in Rio Grande	Date					
	7/27/17	9/27/17				
Rio Grande North	20.0	733.0				
Rio Grande South	236.0	6,131.0				

[1]Wet season defined in MS4 Permit NMR04A000 as July 1 through October 31

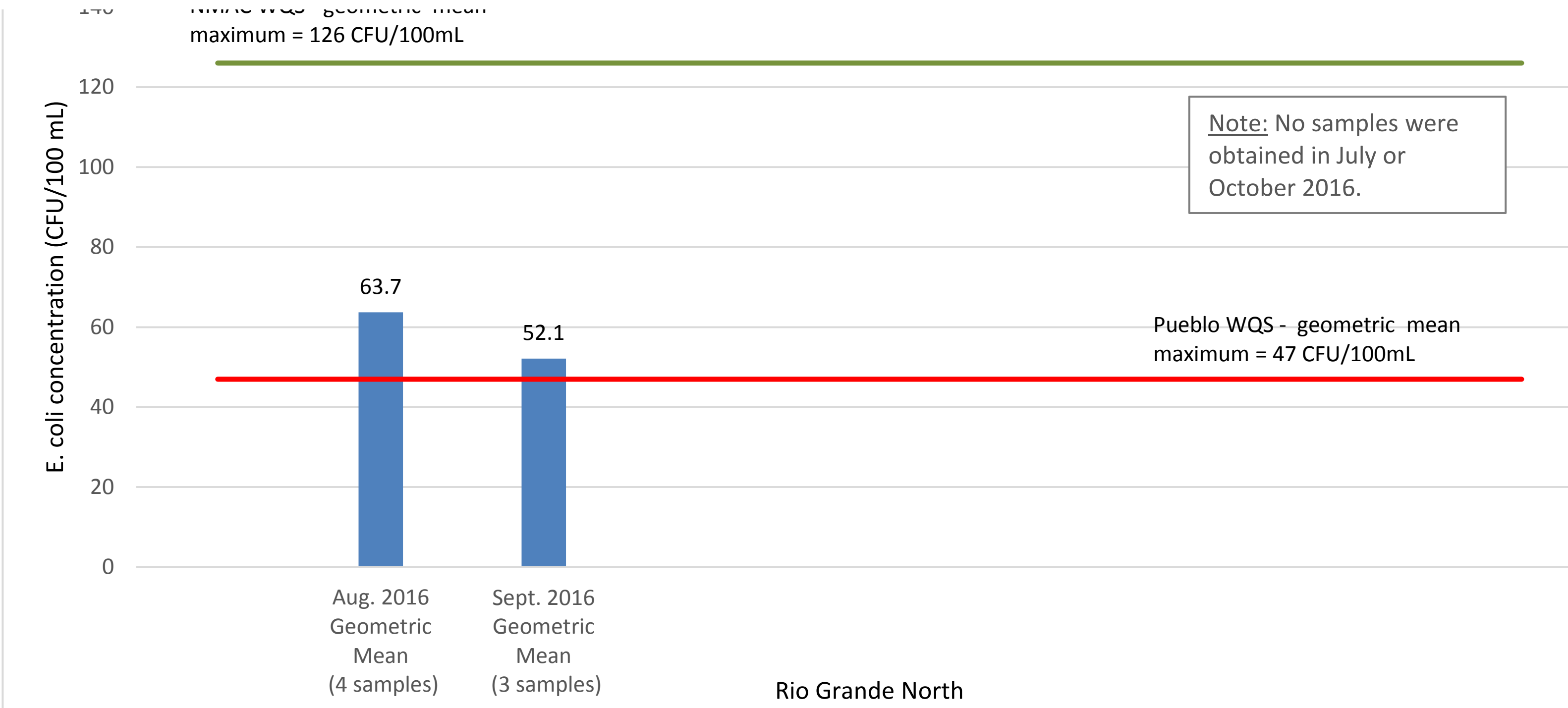
	NMAC WQS - single sample = 410 CFU/100 mL	Pueblo WQS - single sample = 88 CFU/100 mL	NMAC WQS - monthly geometric mean = 126 CFU/100 mL	Pueblo WQS - monthly geometric mean = 47 CFU/100 mL
8/2/2016	410	88	126	47
8/3/2016	410	88	126	47
8/10/2016	410	88	126	47
8/31/2016	410	88	126	47
9/7/2016	410	88	126	47
9/21/2016	410	88	126	47
10/1/2016	410	88	126	47
11/3/2016	410	88	126	47
11/21/2016	410	88	126	47
7/18/2017	410	88	126	47
9/27/2017	410	88	126	47
10/10/2017	410	88	126	47

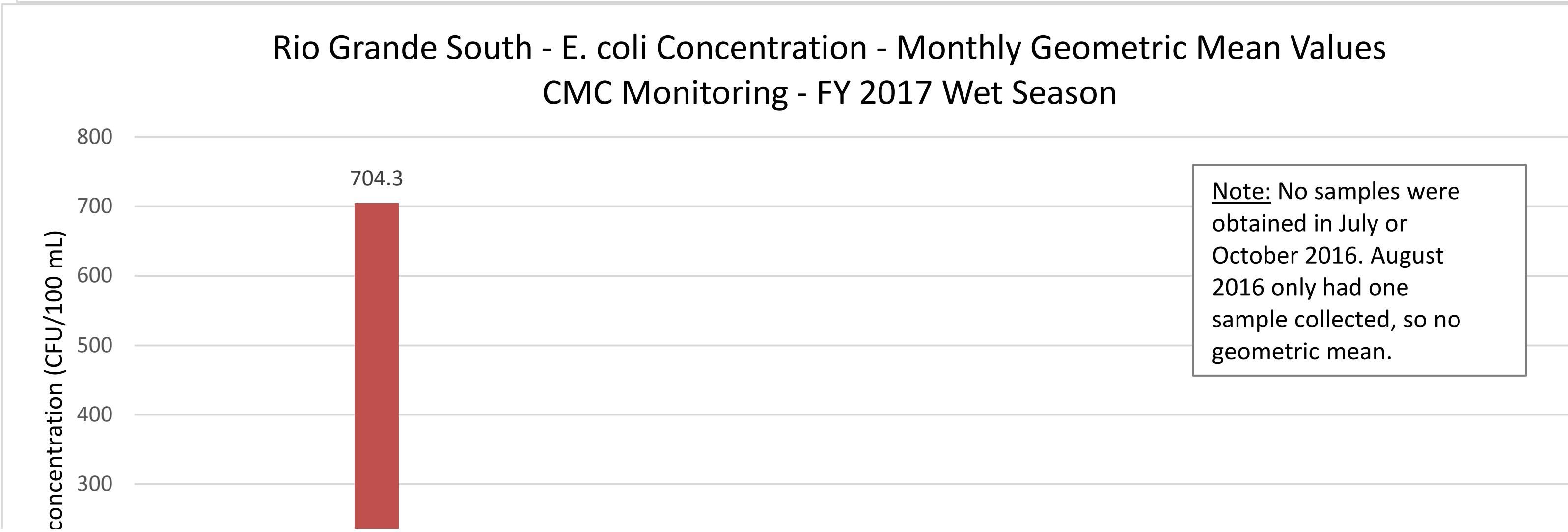
CMC Monitoring - E. coli Results



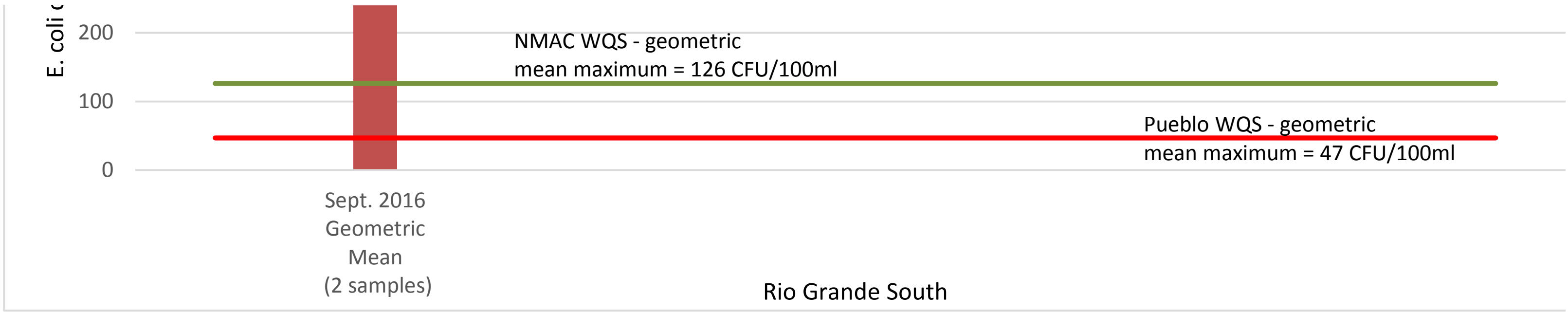


CMC Monitoring - E. coli Results





CMC Monitoring - E. coli Results



CMC Monitoring - E. coli Results

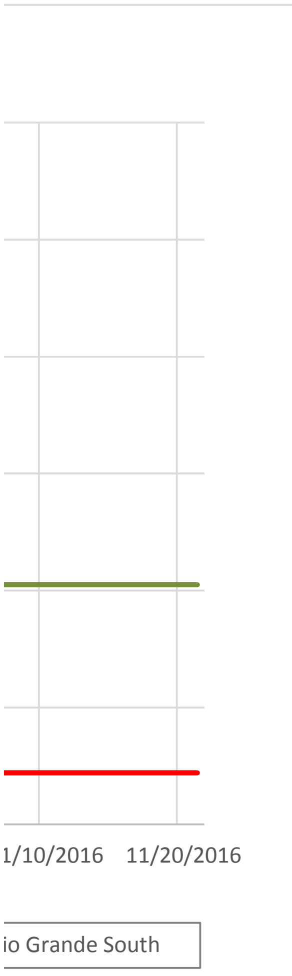
e MS4			Sept. 2016 Geometric Mean (2 samples)				
	Statistical Analysis						
9/21/16		Aug. 2016 Geometric Mean (4 samples)	Sept. 2016 Geometric Mean (3 samples)	Mean	Median		Stand Dev
31.1		63.7	52.1	72.3	55.6		55.2
517.2			704.3	860.7	959.0		306.5

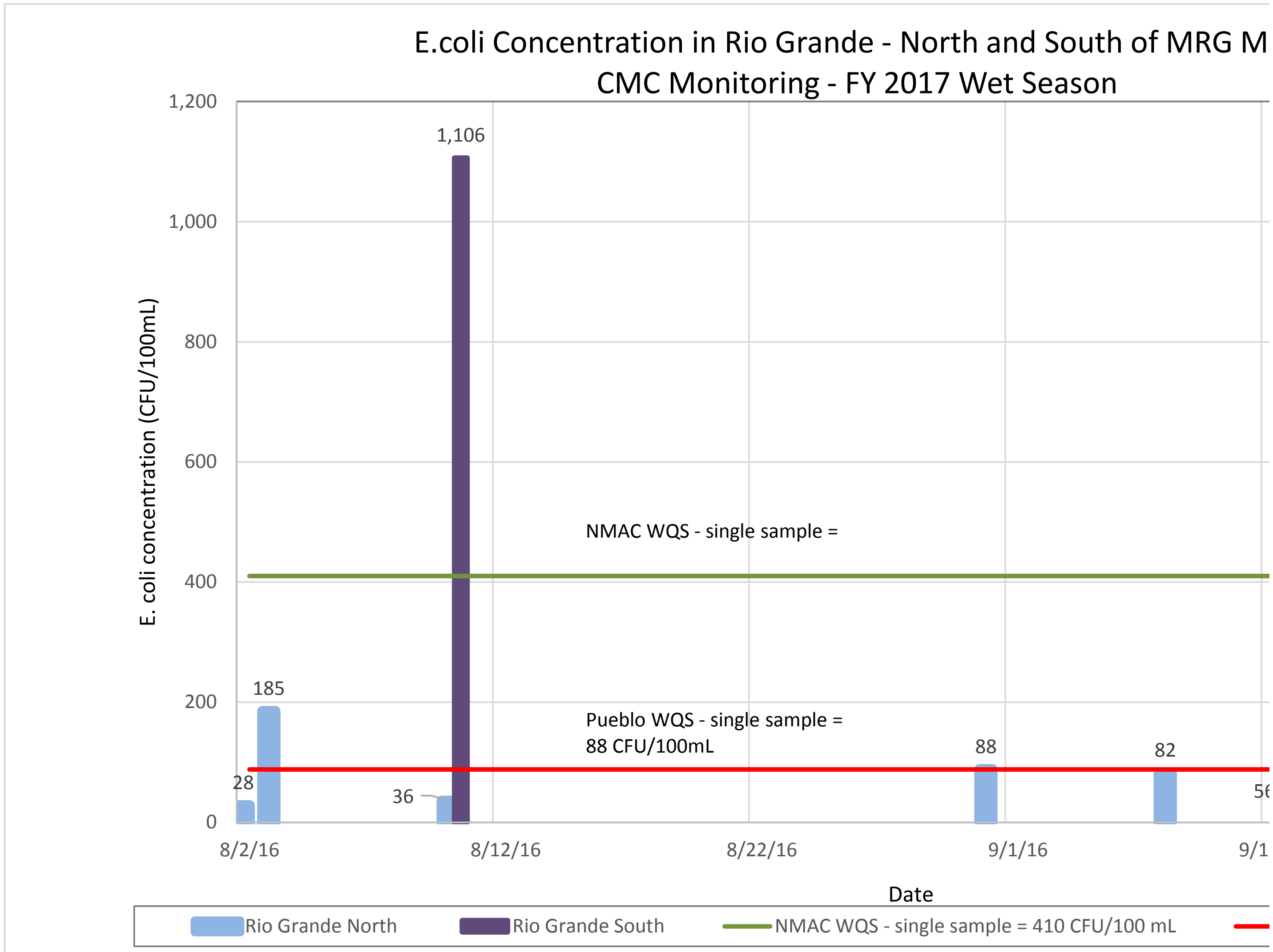
le MS4							
	Statistical Analysis						
	Min	Nov. 2016 Geometric Mean (2 samples)		Mean	Median	Max	Stand Dev
	42.0	42.7		42.8	42.8	43.5	1.1
	7,270.0			7,270	7,270	7,270	

CMC Monitoring - E. coli Results

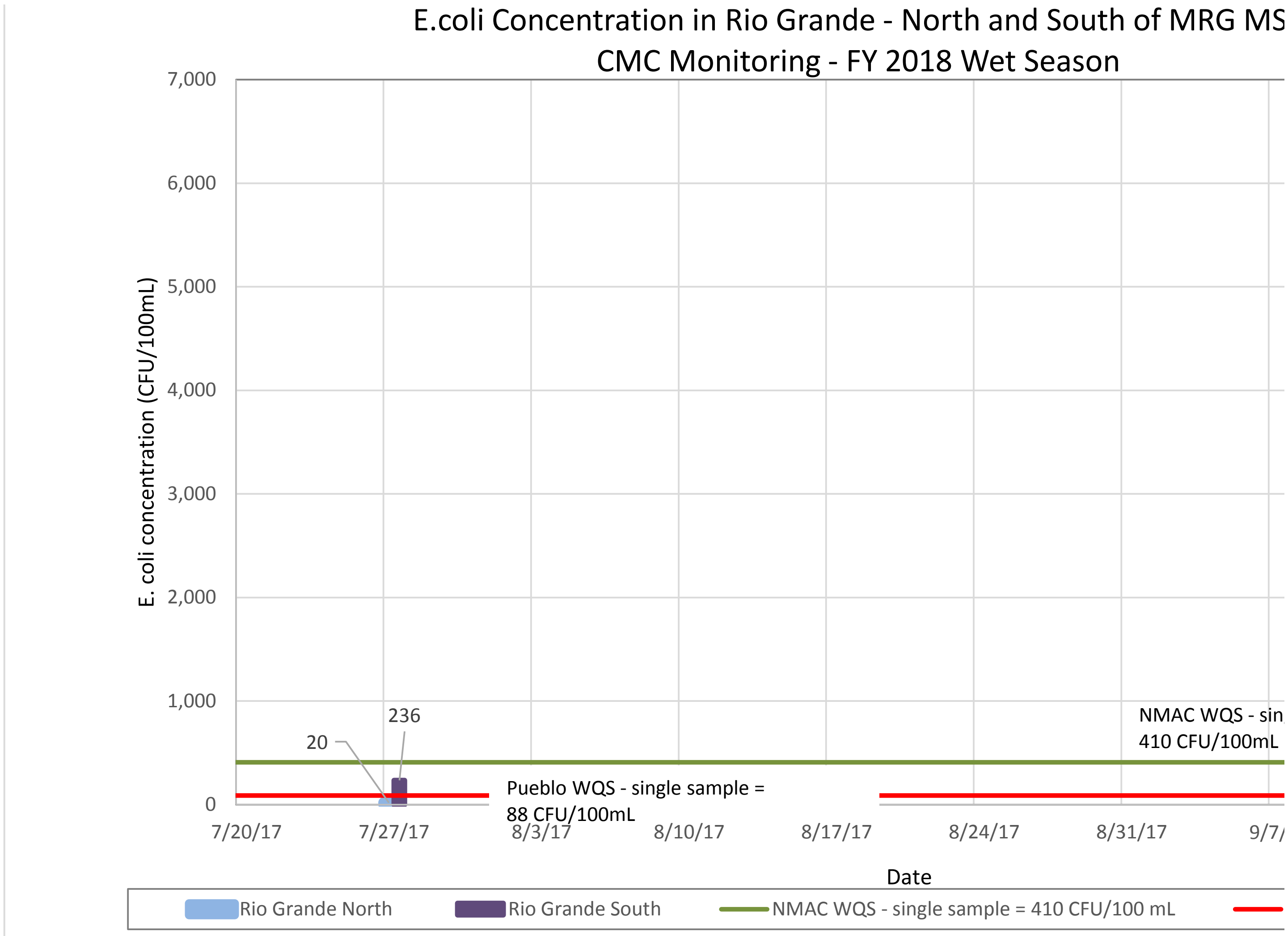
e MS4			Sept. 2016 Geometric Mean (2 samples)				
	Statistical Analysis						
		Aug. 2016 Geometric Mean (4 samples)	Sept. 2016 Geometric Mean (3 samples)	Mean	Median		Stand Dev
		121.1	121.1	376.5	376.5		504.2
			1,202.9	3,183.5	3,183.5		4,168.4

CMC Monitoring - E. coli Results





CMC Monitoring - E. coli Results

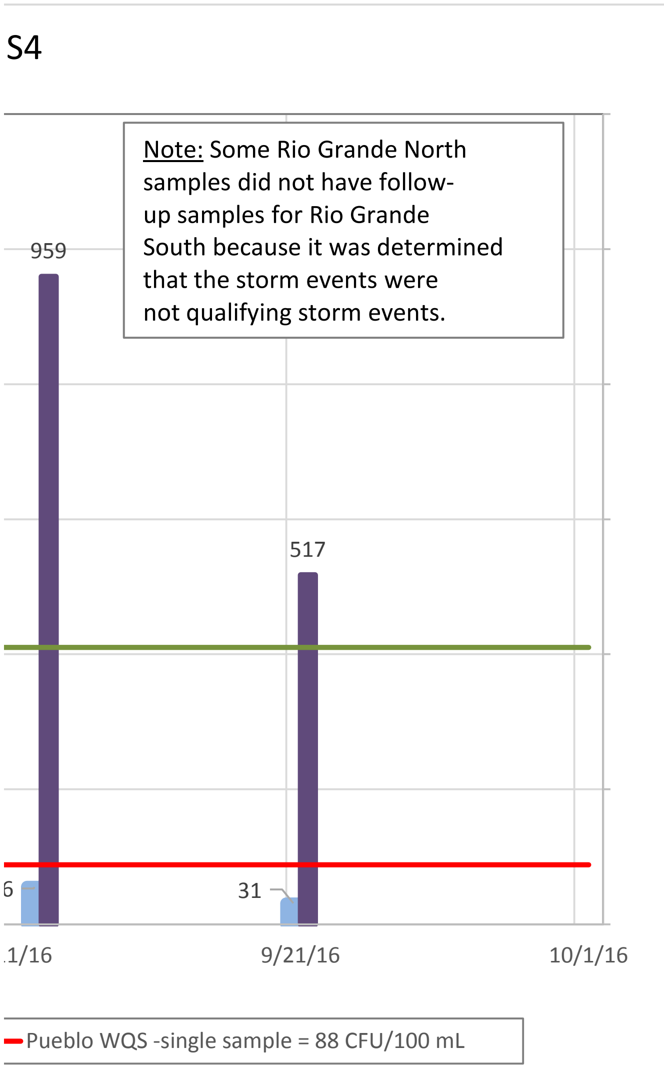


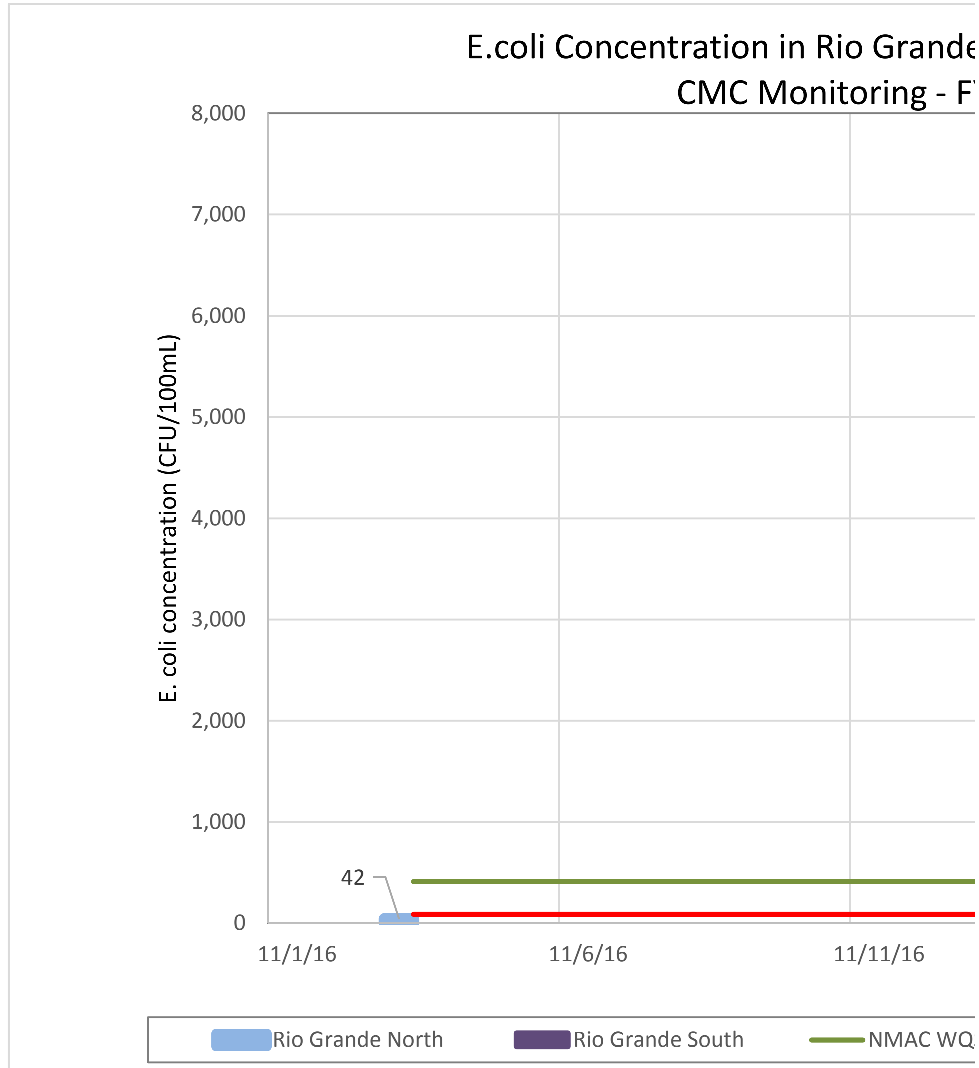
CMC Monitoring - E. coli Results

CMC Monitoring - E. coli Results

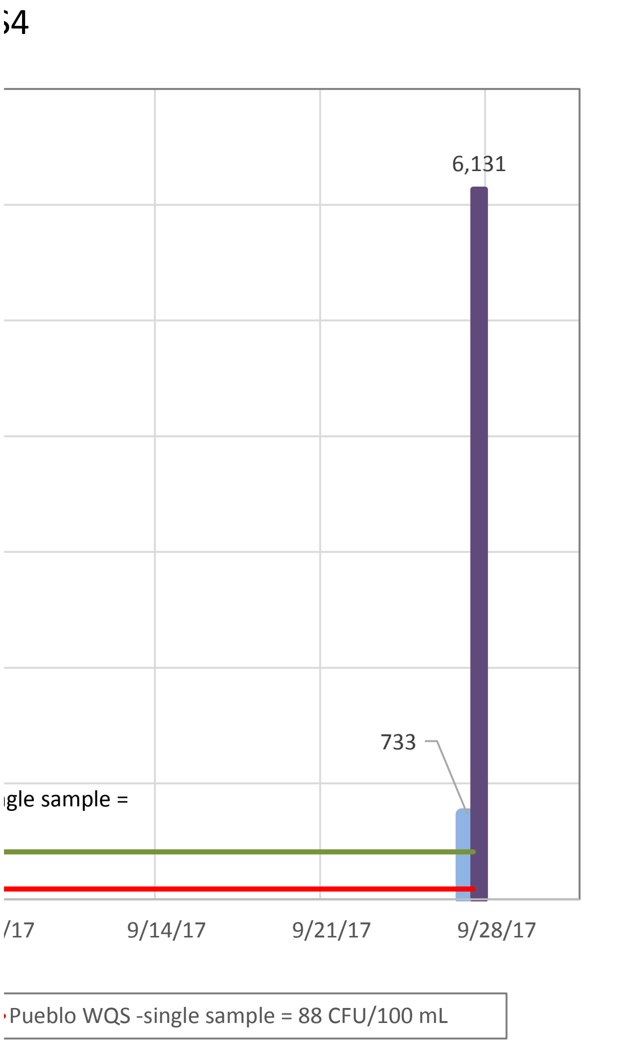
CMC Monitoring - E. coli Results

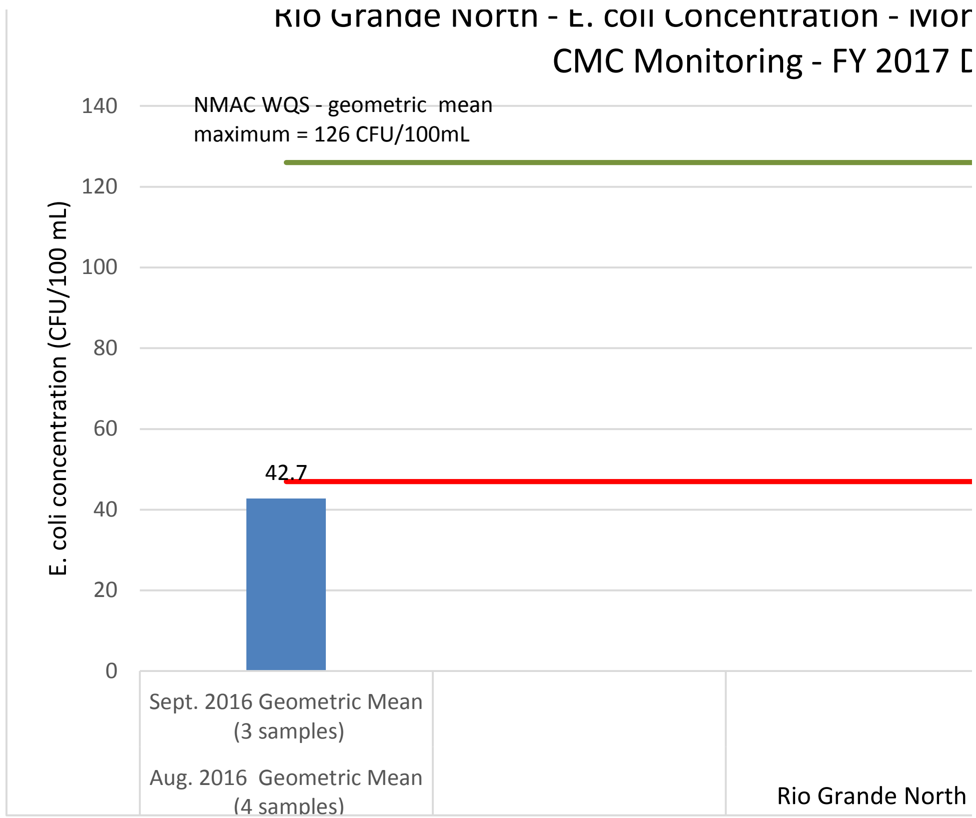
CMC Monitoring - E. coli Results





CMC Monitoring - E. coli Results



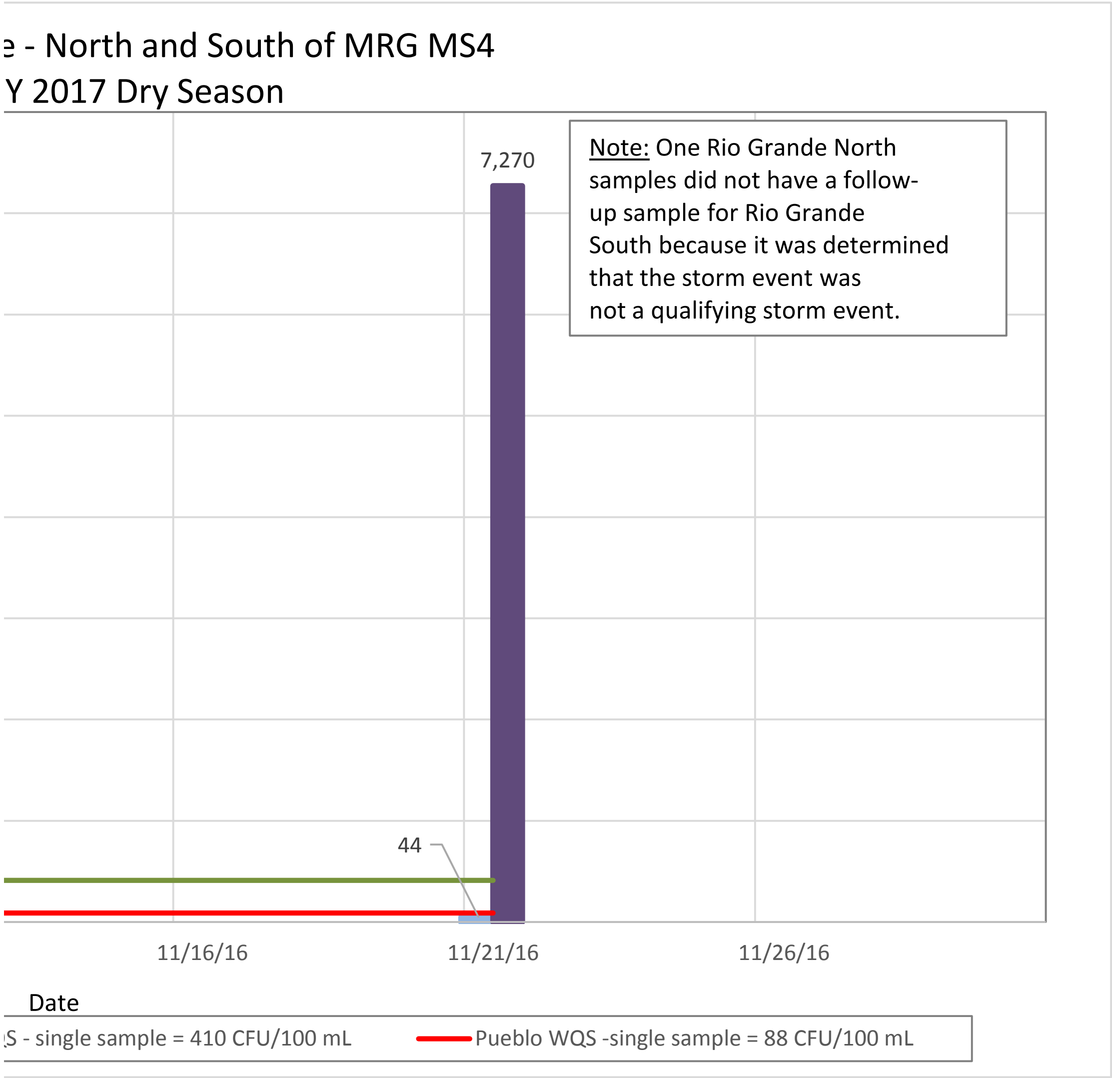


CMC Monitoring - E. coli Results

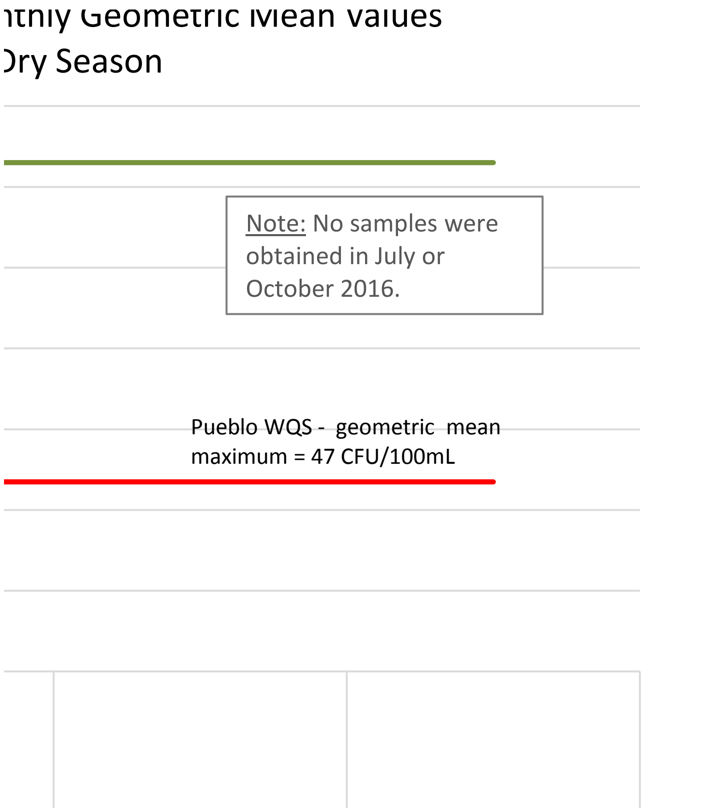
CMC Monitoring - E. coli Results

CMC Monitoring - E. coli Results

CMC Monitoring - E. coli Results



CMC Monitoring - E. coli Results



CMC Sample	1	2
Date	8/10-8/11/16	9/12-9/13/2016
PCB - lab report (ug/L)	N/D	0.00144
MS4 Reporting MQL for PCBs (ug/L = 0.2) *	0.2	0.2
NM Surface WQ Standard Drinking Water Supply=0.5 ug/L	0.5	0.5
Pueblo of Isleta - Wildlife=0.074 ug/L	0.074	0.074
Pueblo of Isleta - Aquatic (Chronic)=0.014 ug/L	0.014	0.014
NM Wildlife and Aquatic (Acute)=0.014 ug/L	0.014	0.014
Pueblo of Isleta -Human Health Fish Consumption=0.00017 ug/L	0.00017	0.00017
NM Human Health-Organism Only (HH-OO)=0.00064 ug/L	0.00064	0.00064

Human Health WQSs - Not Previously Compared for CMC Results

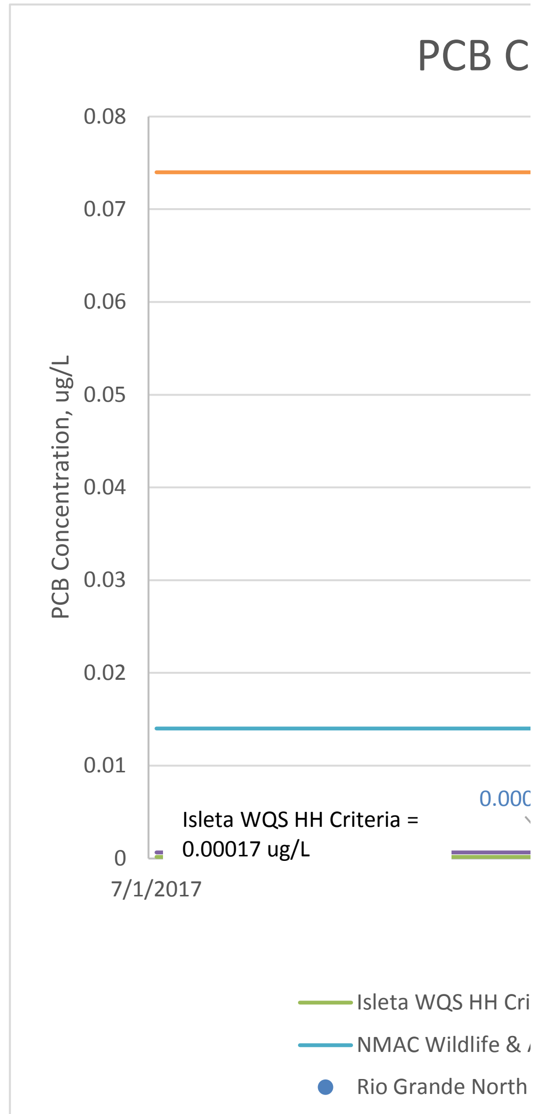
CMC PCB Result Exceeds NM and Pueblo of Isleta Human Health WQSs - All other NM and Pueblo of Isleta WQSs met

CMC PCB Result meets all NM and Pueblo of Isleta WQSs

* Appendix F of Middle Rio Grande Watershed Based MS4 Permit states the following Minimum Quantificati
permit applications and/or compliance reporting. The PCB MQL is 0.2 ug/L - which is higher than all of the W
PCBs set up to report in units of mg/L.

NM Surface WQ Standards - Desig
Rio Grande through Albuquerque (
use designations):
Irrigation
Marginal Warmwater Aquatic Life
Livestock Watering
Public Water Supply
Wildlife Habitat
Primary Contact

	Isleta WQS HH Criteria = 0.00017 ug/L
7/1/2017	0.00017
10/30/2017	0.00017


PCB C
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
PCB Concentration, ug/L
Isleta WQS HH Criteria =
0.00017 ug/L
7/1/2017
Isleta WQS HH Cri
NMAC Wildlife &
Rio Grande North

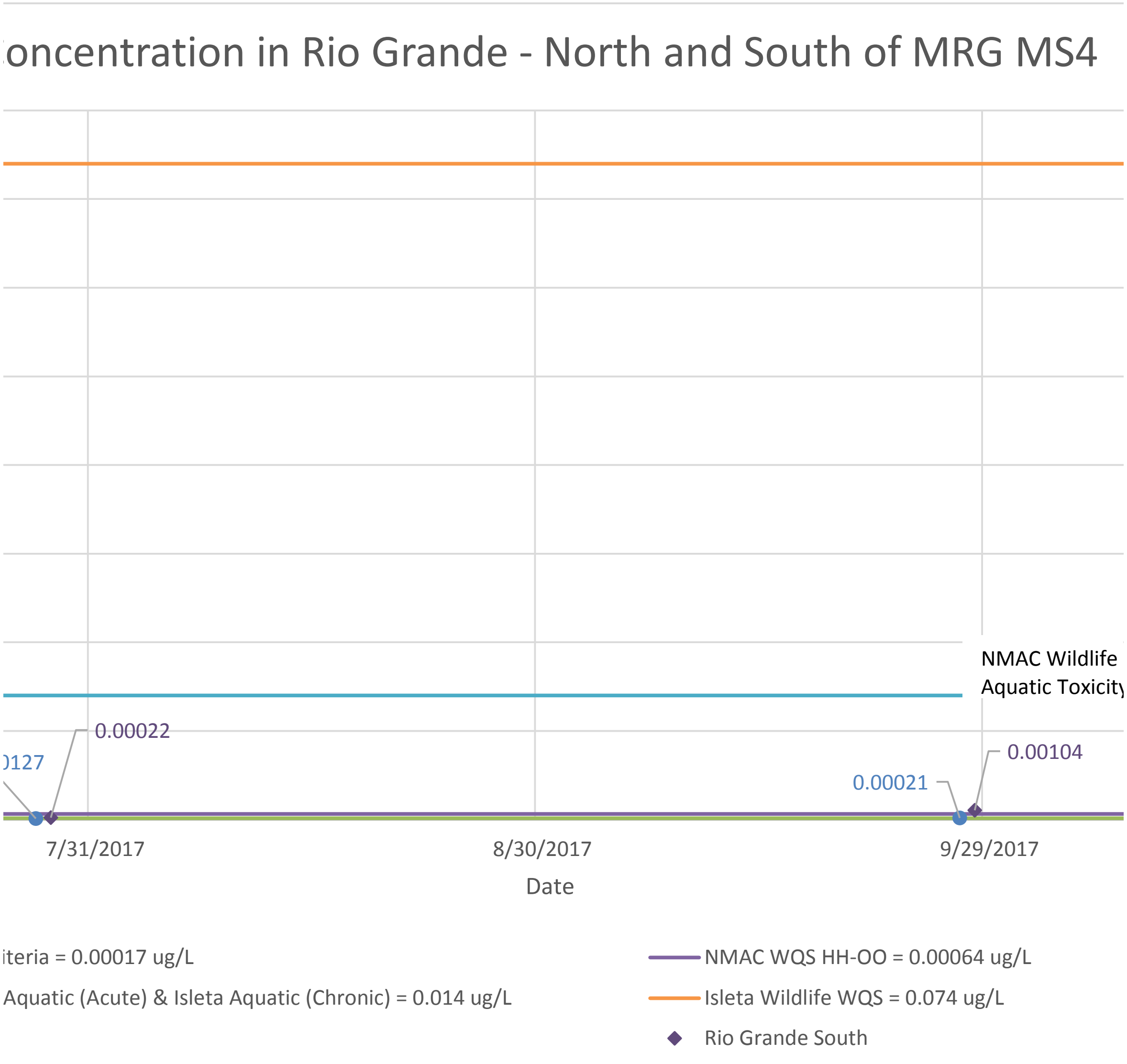
Rio Grande North				
3	4	5	6	1
9/21-9/22/2016	11/21/2016	7/27/2017	9/27/2017	8/11/2016
0.00146	0.00006	0.000127	0.00021	N/D
0.2	0.2	0.2	0.2	0.2
0.5	0.5	0.5	0.5	0.5
0.074	0.074	0.074	0.074	0.074
0.014	0.014	0.014	0.014	0.014
0.014	0.014	0.014	0.014	0.014
0.00017	0.00017	0.00017	0.00017	0.00017
0.00064	0.00064	0.00064	0.00064	0.00064

on Levels (MQLs) are to be used for reporting pollutant data for NPDES
QS values except for drinking water. In the net DMR forms, EPA has

nated Uses for
(2 reaches, same

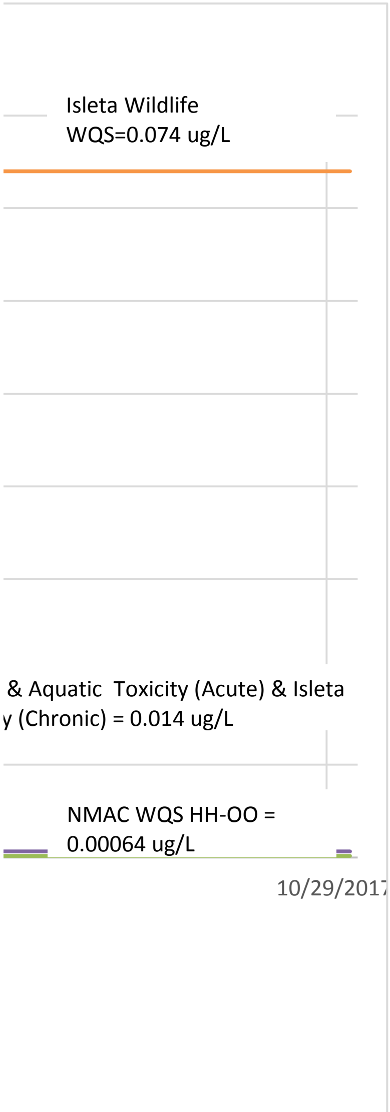
Isleta Pueblo Surface WQ Standards - Designated Uses for Rio Grande through the Pueblo:
Irrigation
Warmwater Fishery Use
Primary Contact Ceremonial Use
Primary Contact Recreational Use
Agricultural Water Supply Use
Industrial Water Supply Use
Wildlife Usage

NMAC WQS HH-OO = 0.00064 ug/L	NMAC Wildlife & Aquatic (Acute) & Isleta Aquatic (Chronic) = 0.014 ug/L	Isleta Wildlife WQS = 0.074 ug/L	NMAC Drinking Water WQS = 0.5 ug/L
0.00064	0.014	0.074	0.5
0.00064	0.014	0.074	0.5



oncentration in Rio Grande - North and South of MRG MS4
NMAC Wildlife
Aquatic Toxicity
0.00022
)127
0.00021
0.00104
7/31/2017
8/30/2017
9/29/2017
Date
iteria = 0.00017 ug/L
Aquatic (Acute) & Isleta Aquatic (Chronic) = 0.014 ug/L
NMAC WQS HH-OO = 0.00064 ug/L
Isleta Wildlife WQS = 0.074 ug/L
Rio Grande South

Rio Grande South				
2	3	4	5	6
9/13/2016	9/22/2016	11/22/2016	7/28/2017	9/28/2017
0.00272	0.002190	0.001720	0.00022	0.00104
0.2	0.2	0.2	0.2	0.2
0.5	0.5	0.5	0.5	0.5
0.074	0.074	0.074	0.074	0.074
0.014	0.014	0.014	0.014	0.014
0.014	0.014	0.014	0.014	0.014
0.00017	0.00017	0.00017	0.00017	0.00017
0.00064	0.00064	0.00064	0.00064	0.00064



Isleta Wildlife
WQS=0.074 ug/L
& Aquatic Toxicity (Acute) & Isleta
y (Chronic) = 0.014 ug/L
NMAC WQS HH-OO =
0.00064 ug/L
10/29/2017

CMC Dissolved Oxygen Data Comparisons

FY 2017 - Wet Season[1] - Dissolved Oxygen Results (mg/L) in the Rio Grande - Nort				
Location in Rio Grande	Date			
	8/2/16	8/3/16	8/10/16	8/31/16
Rio Grande North	5.9	5.8	7.2	7.1
Rio Grande South			5.3	

[1]Wet season defined in MS4 Permit NMR04A000 as July 1 through October 31

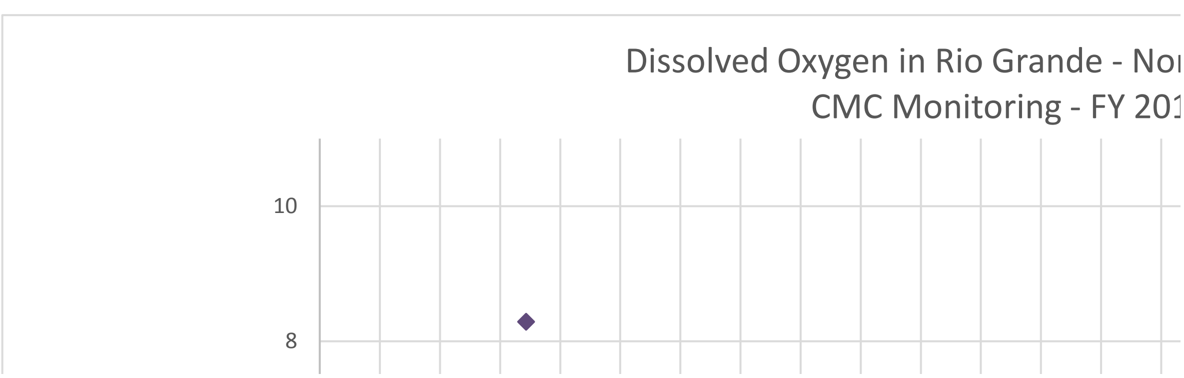
FY 2017 - Dry Season[1] - Dissolved Oxygen Results (mg/L) in the Rio Grande - Nort				
Location in Rio Grande	**Date**			
	11/3/16	**11/21/16**		
Rio Grande North	8.6	10.6		
Rio Grande South		8.0		

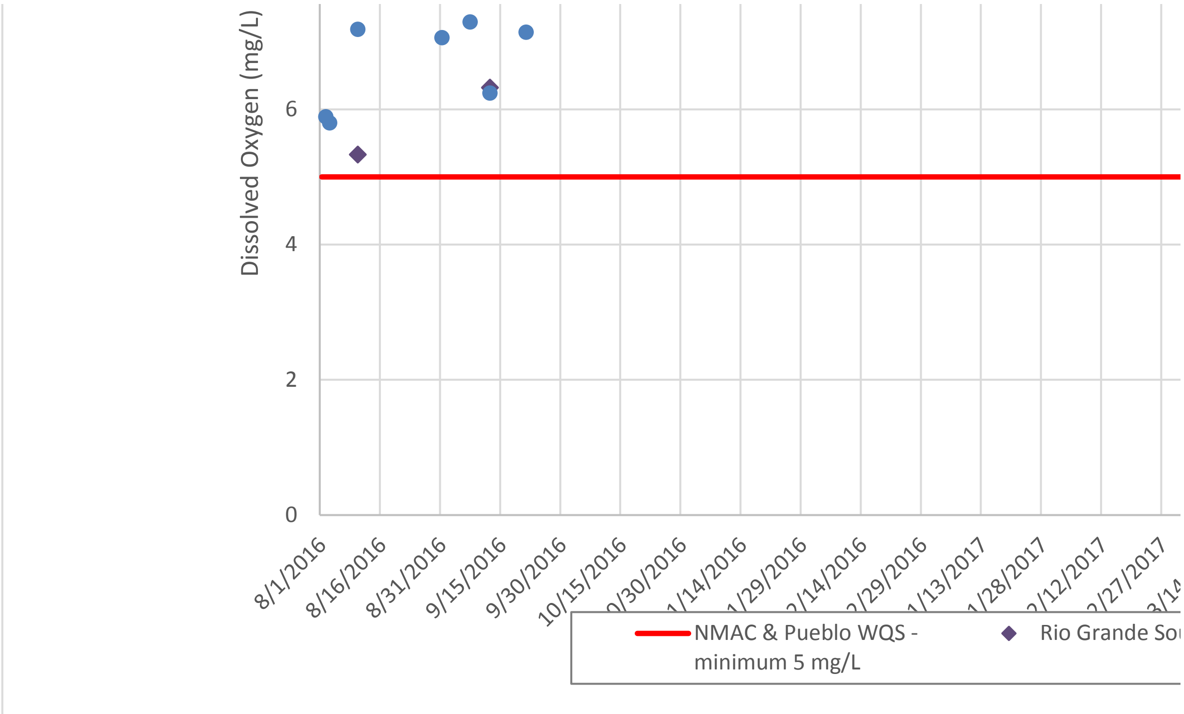
[1]Dry season defined in MS4 Permit NMR04A000 as November 1 through June 30

FY 2018 - Wet Season[1] - Dissolved Oxygen Results (mg/L) in the Rio Grande - Nort				
Location in Rio Grande	Date			
	7/27/17	9/27/17		
Rio Grande North	6.7	7.1		
Rio Grande South	6.8	7.2		

[1]Wet season defined in MS4 Permit NMR04A000 as July 1 through October 31

	NMAC & Pueblo WQS - minimum 5 mg/L
8/1/2016	5
8/3/2016	5
8/10/2016	5
8/31/2016	5
9/7/2016	5
9/21/2016	5
10/1/2016	5
7/1/2017	5
10/15/2017	5

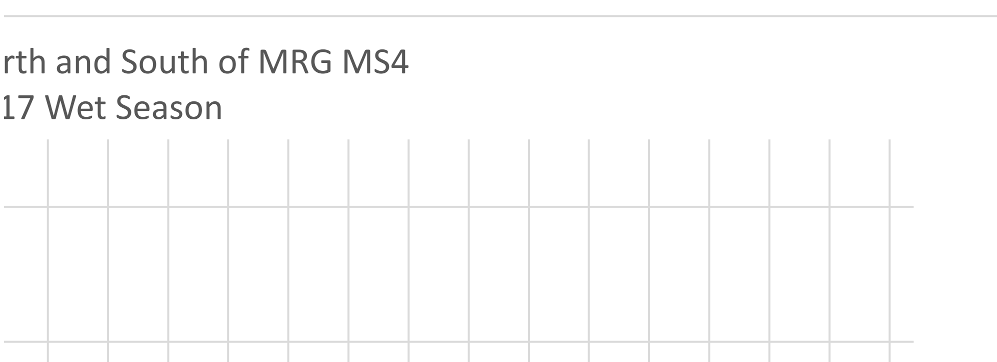


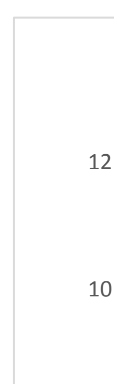

Dissolved Oxygen (mg/L)
0
2
4
6
8/1/2016
8/16/2016
8/31/2016
9/15/2016
9/30/2016
10/15/2016
NMAC & Pueblo WQS - minimum 5 mg/L
Rio Grande So

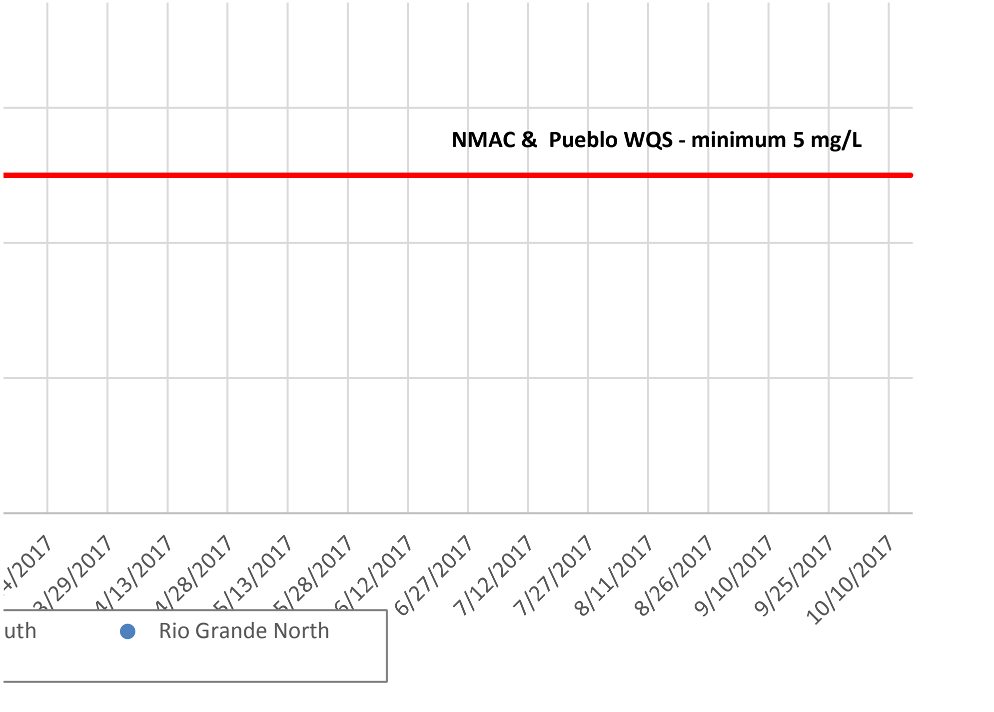
th and South of the Middle Rio Grande MS4				
9/7/16	9/12/16	9/21/16	11/3/16	11/21/16
7.3	6.2	7.1	8.6	10.6
	6.3	8.3		8.0

h and South of the Middle Rio Grande MS4		

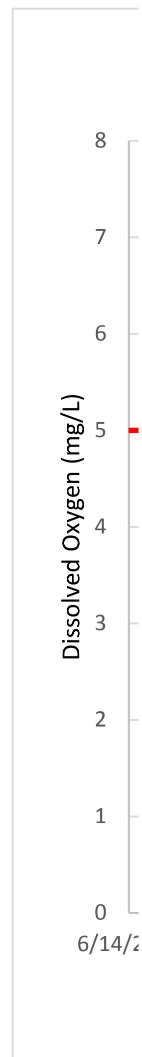
th and South of the Middle Rio Grande MS4				

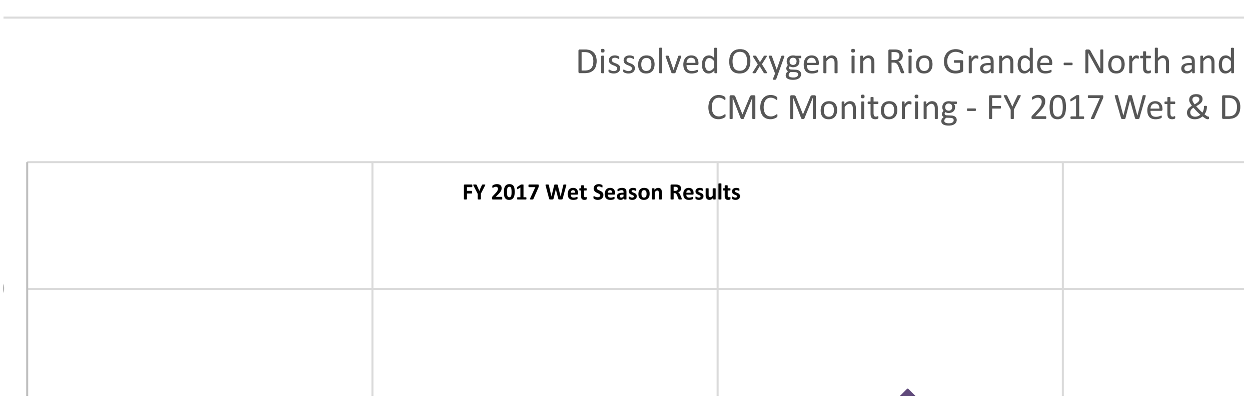


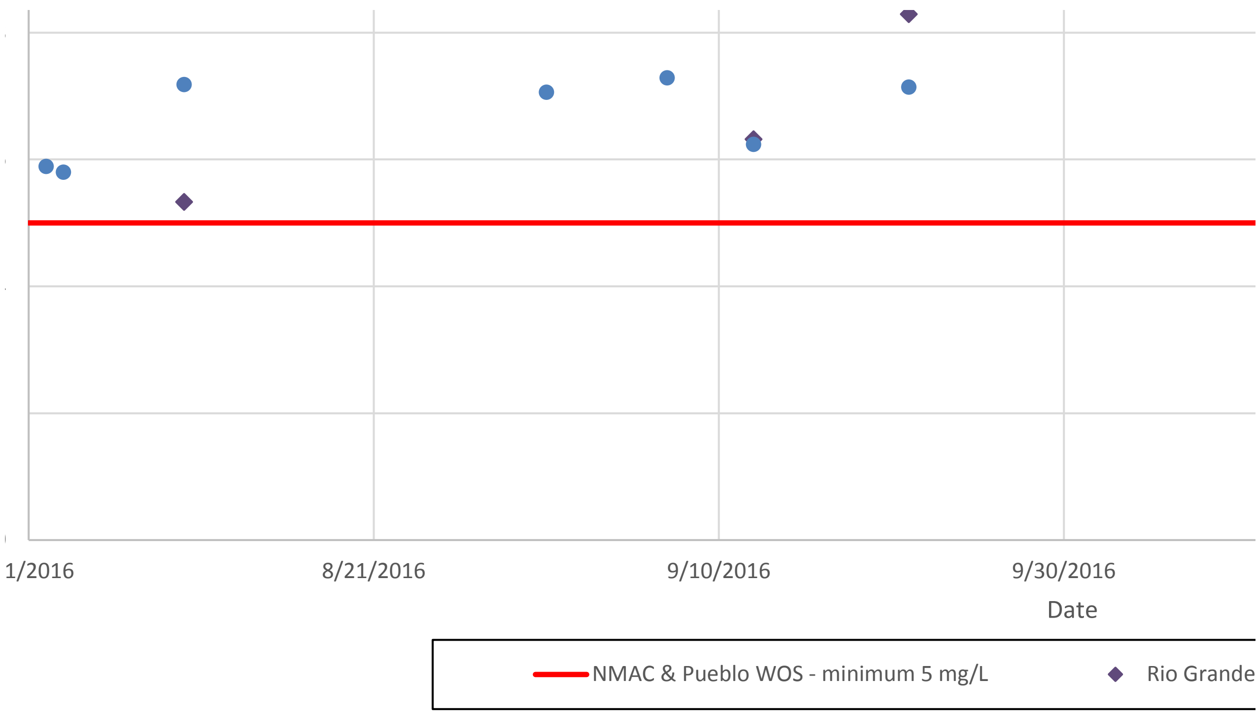


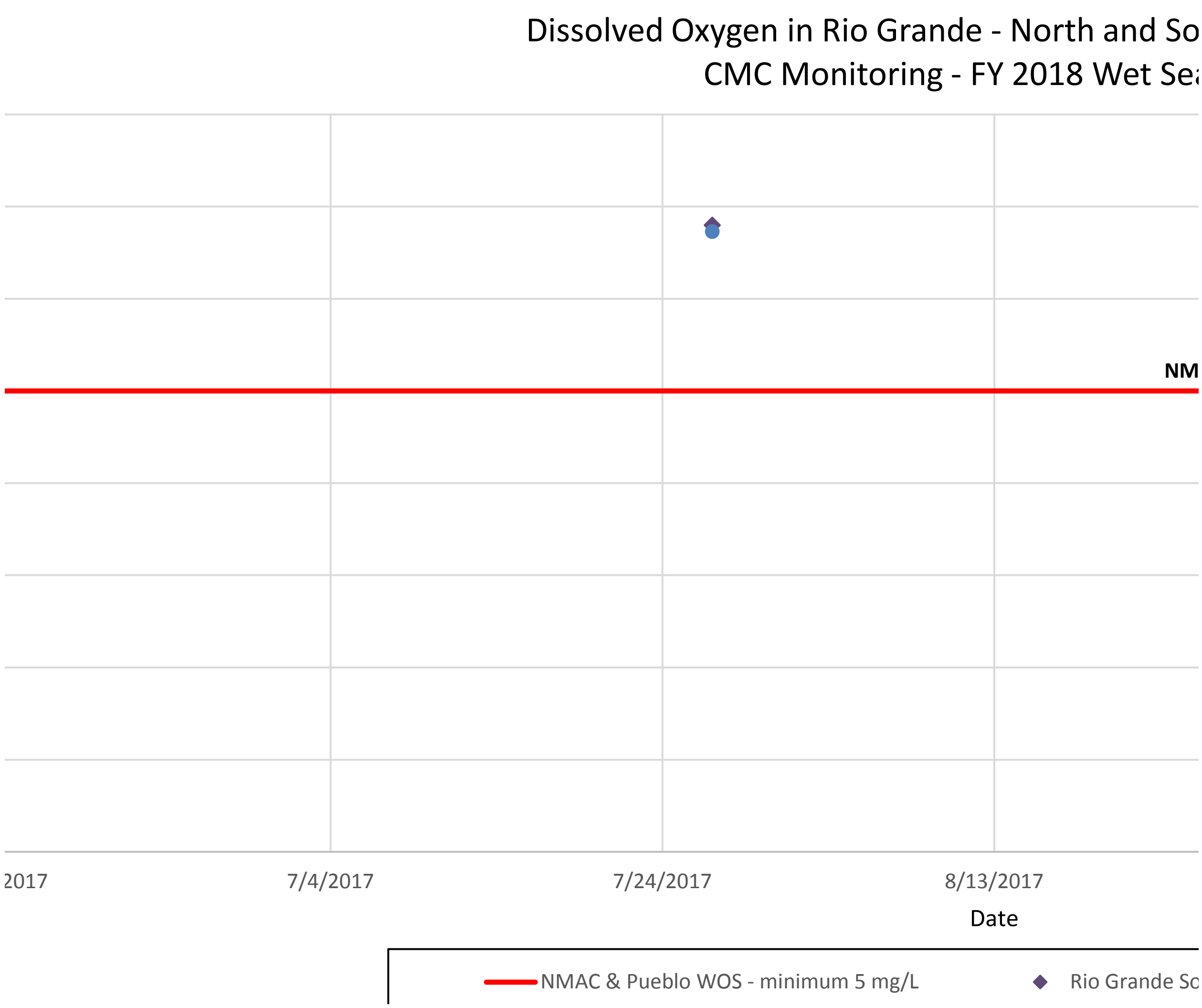

NMAC & Pueblo WQS - minimum 5 mg/L
3/29/2017
4/13/2017
4/28/2017
5/13/2017
5/28/2017
6/12/2017
6/27/2017
7/12/2017
7/27/2017
8/11/2017
8/26/2017
9/10/2017
9/25/2017
10/10/2017
uth
Rio Grande North


Dissolved Oxygen (mg/L)
8
6
4
2
0

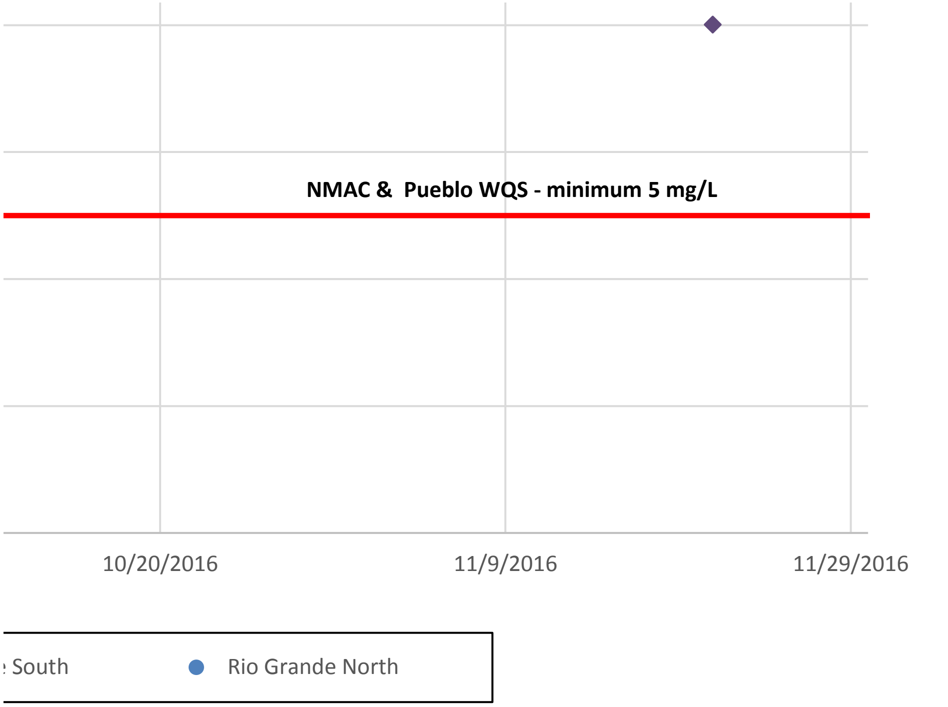

Dissolved Oxygen (mg/L)
8
7
6
5
4
3
2
1
0


Dissolved Oxygen in Rio Grande - North and S
CMC Monitoring - FY 2017 Wet & Dr
FY 2017 Wet Season Results

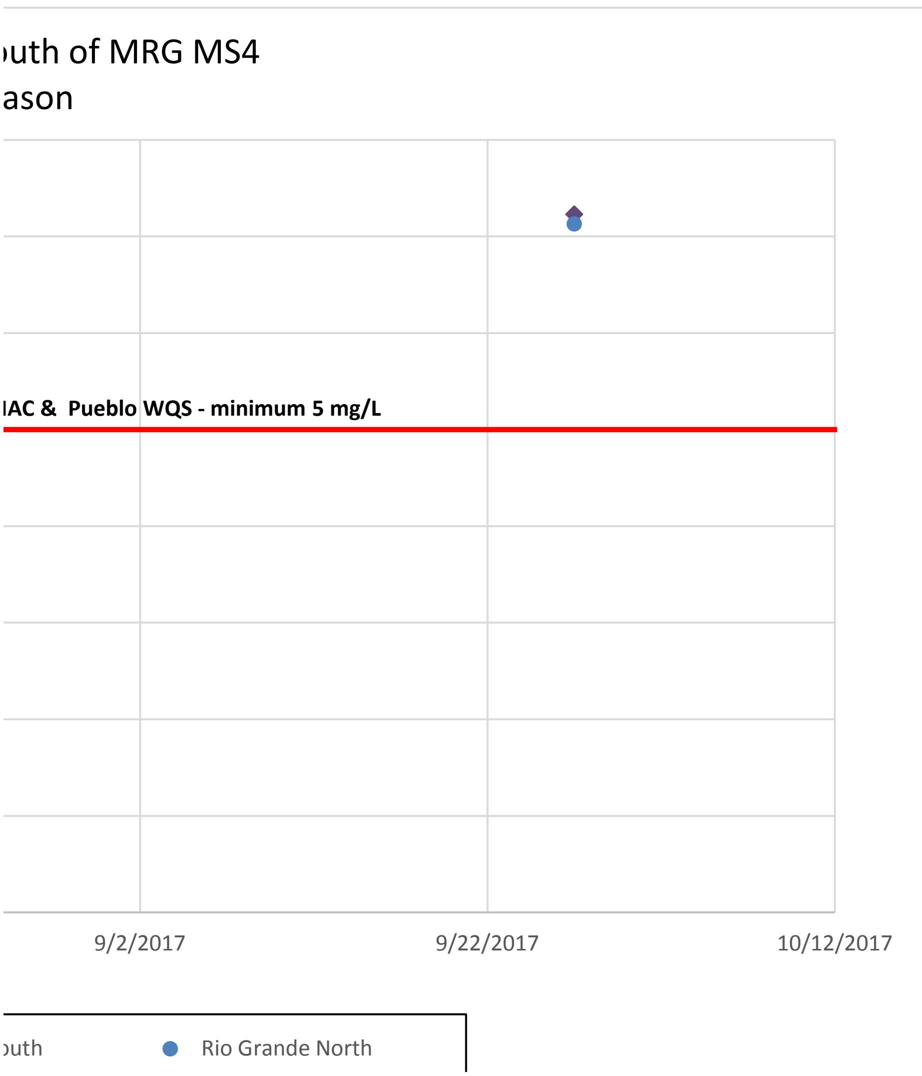

1/2016
8/21/2016
9/10/2016
9/30/2016
Date
NMAC & Pueblo WOS - minimum 5 mg/L
Rio Grande


Dissolved Oxygen in Rio Grande - North and So
CMC Monitoring - FY 2018 Wet Sea
NM
2017
7/4/2017
7/24/2017
8/13/2017
Date
NMAC & Pueblo WOS - minimum 5 mg/L
Rio Grande Sc


South of MRG MS4
y Seasons
FY 2017 Dry Season Results



NMAC & Pueblo WQS - minimum 5 mg/L
10/20/2016
11/9/2016
11/29/2016
: South
Rio Grande North



uth of MRG MS4
ason
IAC & Pueblo WQS - minimum 5 mg/L
9/2/2017
9/22/2017
10/12/2017
uth
Rio Grande North

CMC Temperature Data Comparisons

FY 2017 - Wet Season[1] - Temperature Results (°C) in the Rio Grande - North an				
Location in Rio Grande	Date			
	8/2/16	8/3/16	8/10/16	8/31/16
Rio Grande North	24.2	23.7	22.8	21.2
Rio Grande South			24.9	
NMAC & Pueblo WQS	32.2	32.2	32.2	32.2

[1]Wet season defined in MS4 Permit NMR04A000 as July 1 through October 31

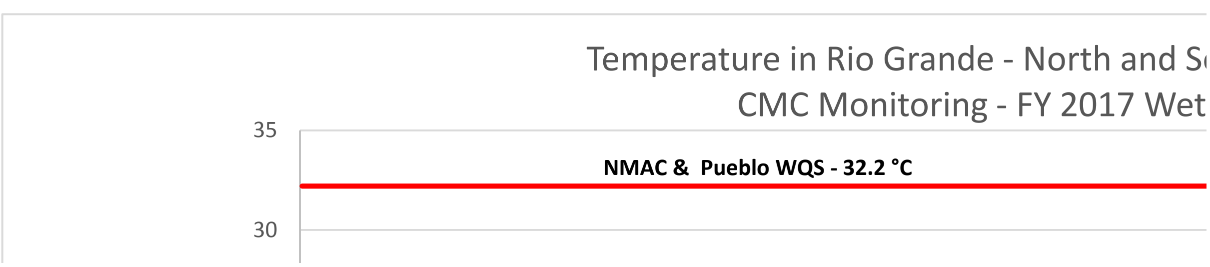
FY 2017 - Dry Season[1] - Temperature Results (°C) in the Rio Grande - North an				
Location in Rio Grande	**Date**			
	11/3/16	**11/21/16**		
Rio Grande North	14.6	10.4		
Rio Grande South		9.3		

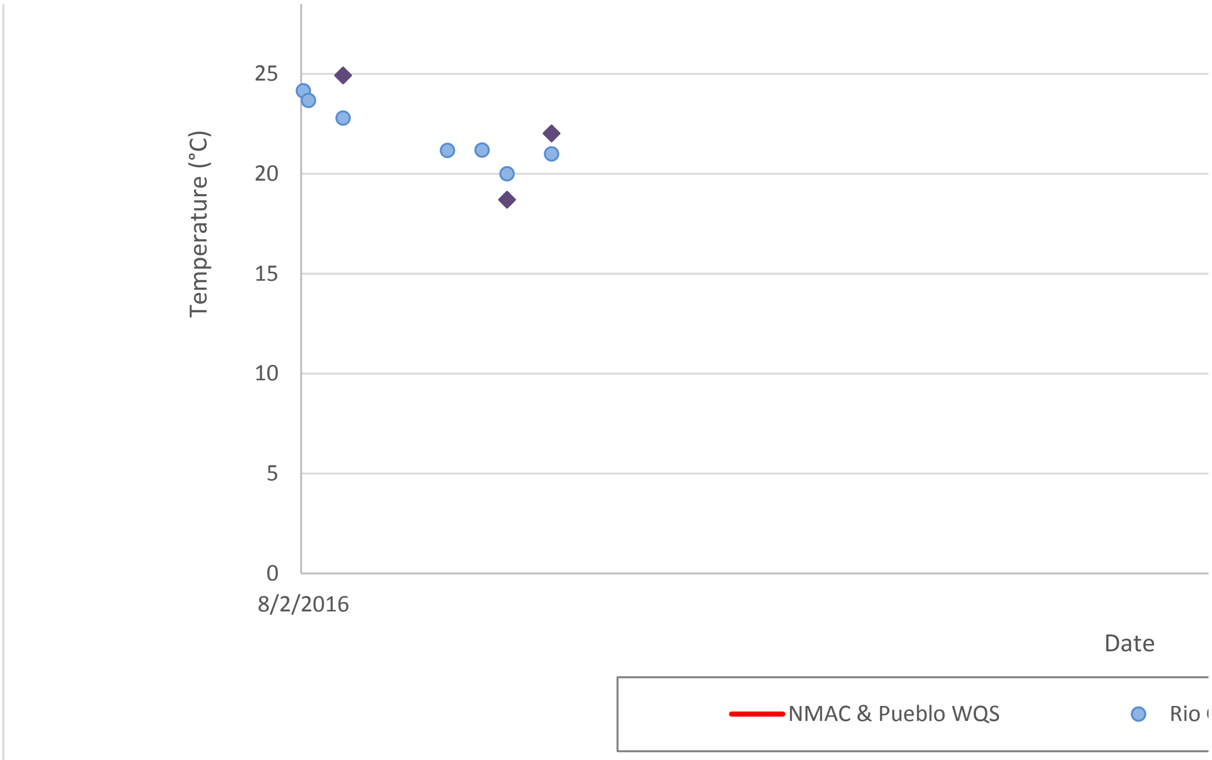
[1]Dry season defined in MS4 Permit NMR04A000 as November 1 through June 30

FY 2018 - Wet Season[1] - Temperature Results (°C) in the Rio Grande - North an				
Location in Rio Grande	Date			
	7/27/17	9/27/17		
	7/1/17	10/15/17		
Rio Grande North	23.5	16.3		
Rio Grande South	23.6	15.2		
NMAC & Pueblo WQS	32.2	32.2		

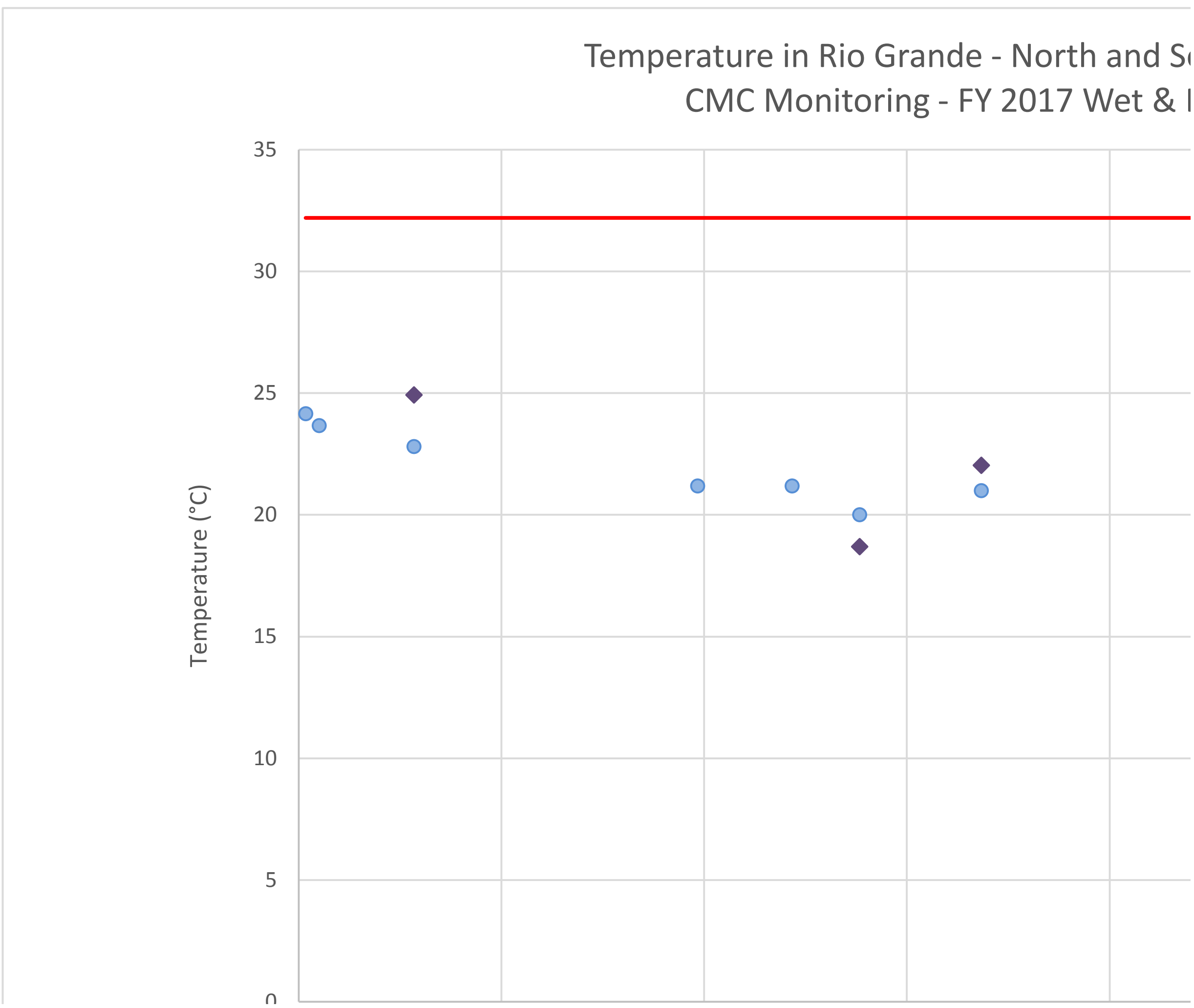
[1]Wet season defined in MS4 Permit NMR04A000 as July 1 through October 31

	NMAC & Pueblo WQS
8/2/2016	32.2
8/3/2016	32.2
8/10/2016	32.2
8/31/2016	32.2
9/7/2016	32.2
9/21/2016	32.2
7/1/2017	32.2
10/15/2017	32.2

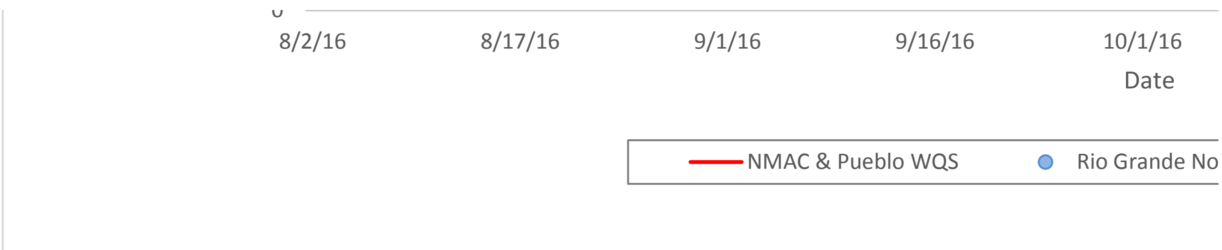


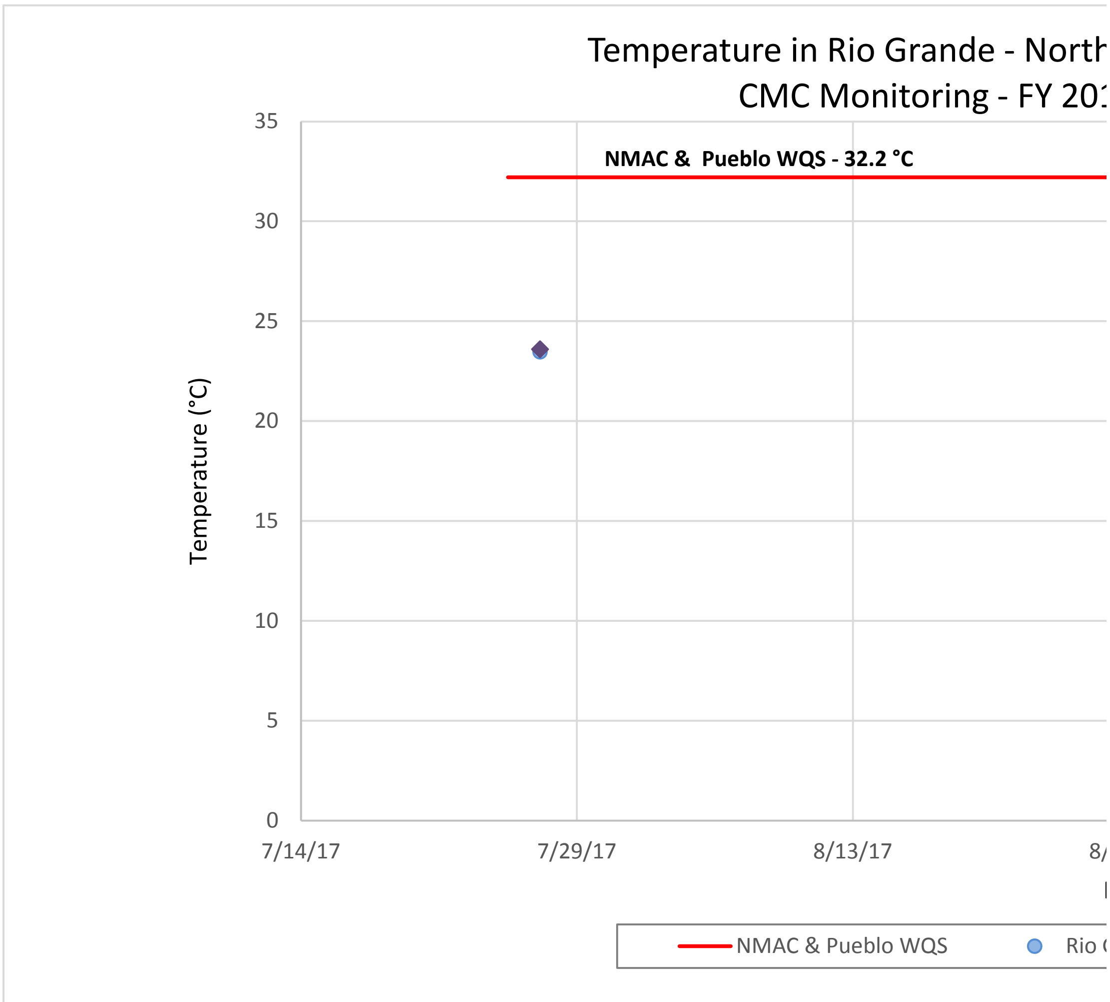


25
20
15
10
5
0
Temperature (°C)
8/2/2016
Date
NMAC & Pueblo WQS
Rio



Temperature in Rio Grande - North and S
CMC Monitoring - FY 2017 Wet &
35
30
25
20
15
10
5
Temperature (°C)

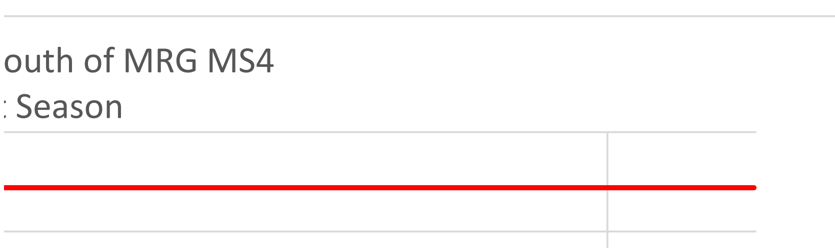

0
8/2/16
8/17/16
9/1/16
9/16/16
10/1/16
Date
NMAC & Pueblo WQS
Rio Grande No

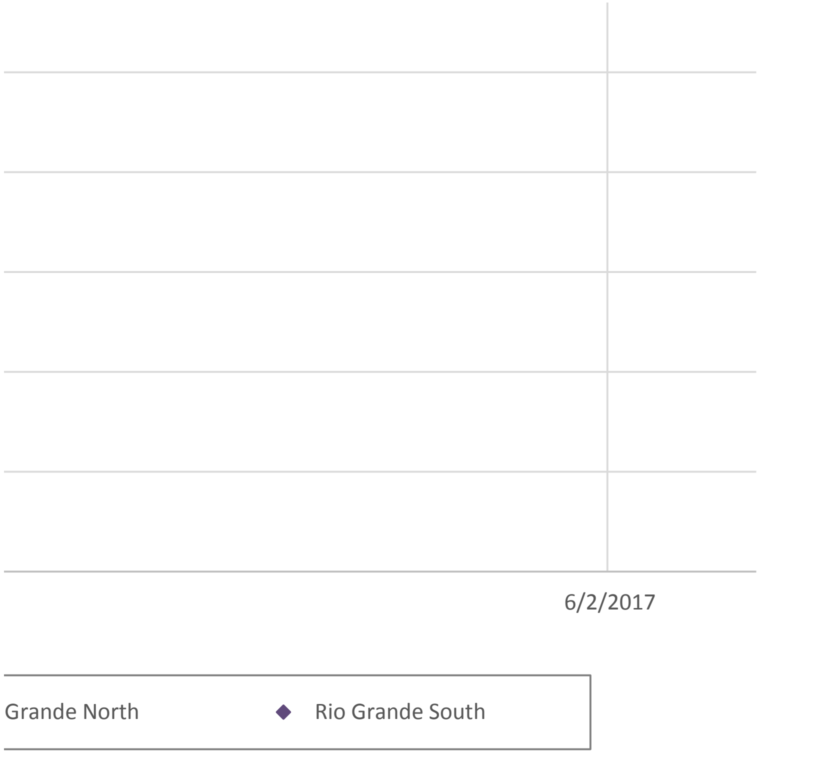

Temperature in Rio Grande - North
CMC Monitoring - FY 20
NMAC & Pueblo WQS - 32.2 °C
Temperature (°C)
35
30
25
20
15
10
5
0
7/14/17
7/29/17
8/13/17
NMAC & Pueblo WQS
Rio

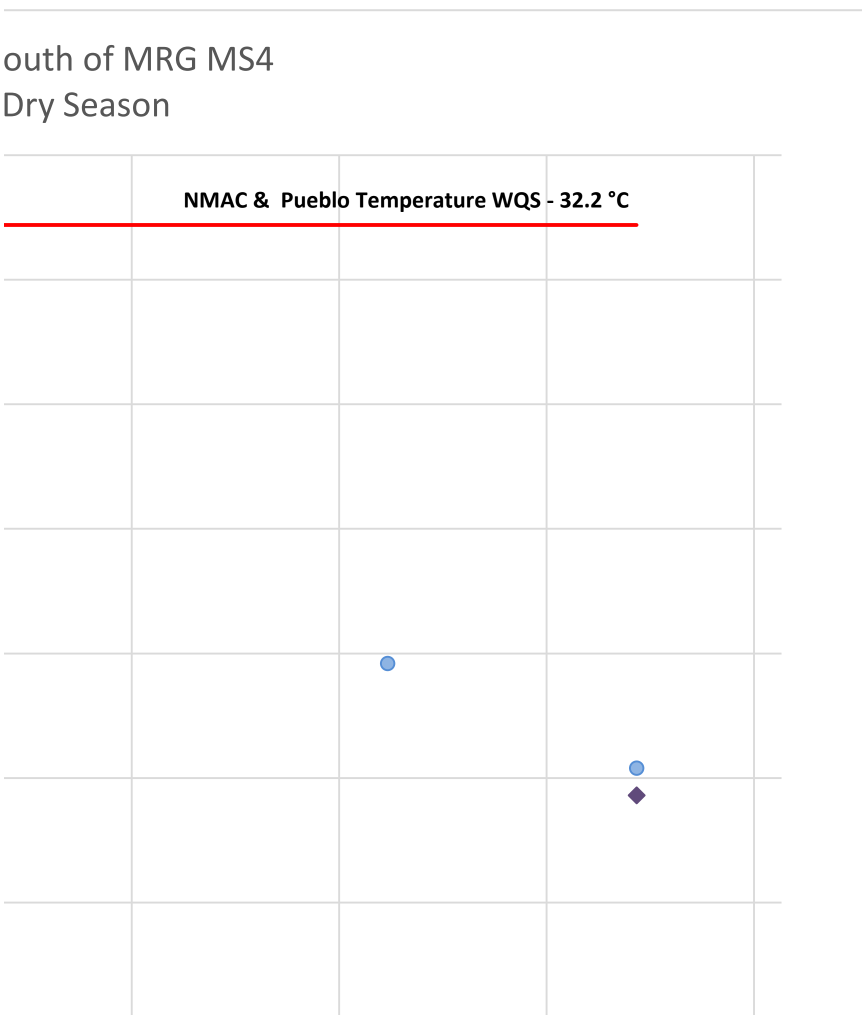
d South of the Middle Rio Grande MS4		
9/7/16	9/12/16	9/21/16
21.2	20.0	21.0
	18.7	22.0
32.2	32.2	32.2

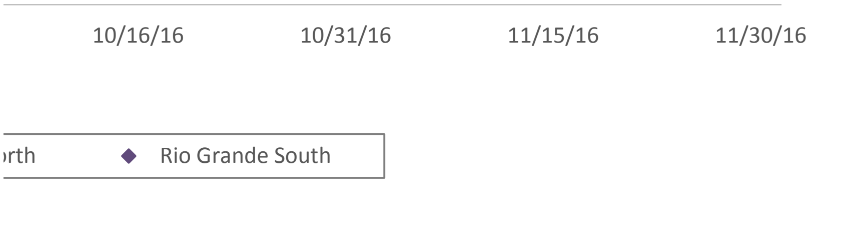
d South of the Middle Rio Grande MS4		

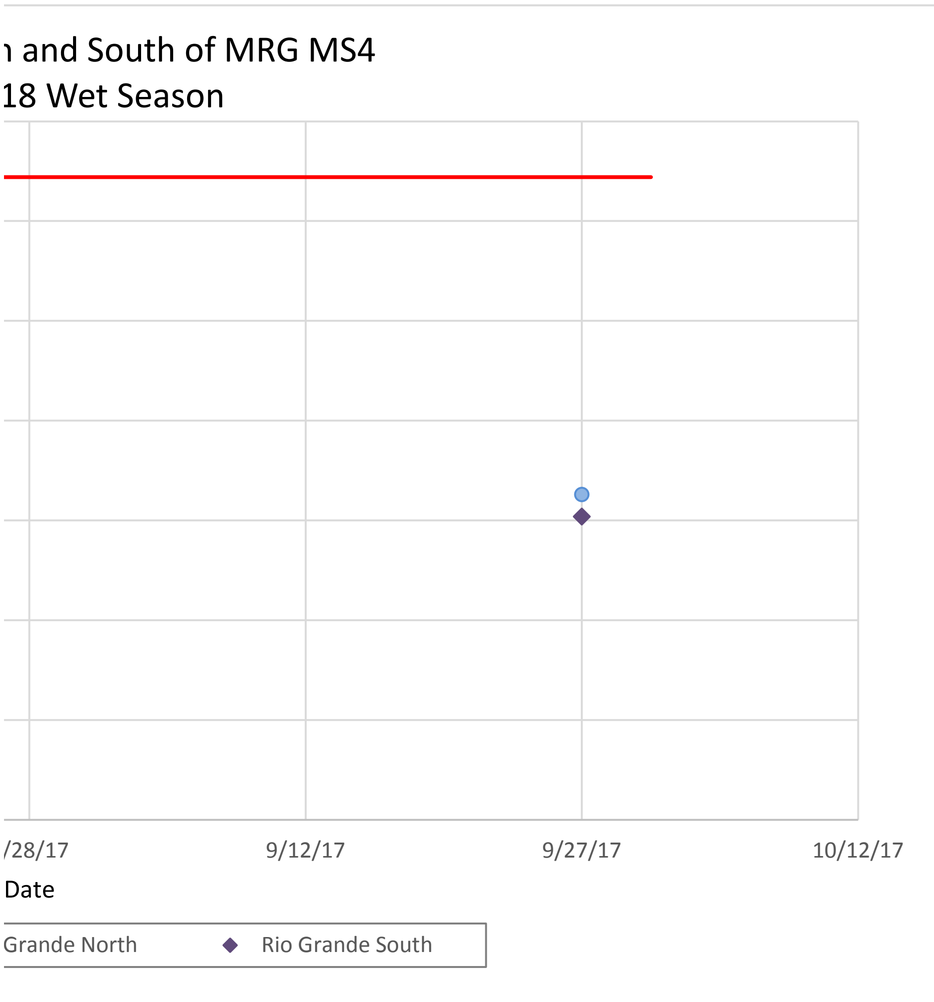
d South of the Middle Rio Grande MS4		




6/2/2017
Grande North
Rio Grande South


outh of MRG MS4
Dry Season
NMAC & Pueblo Temperature WQS - 32.2 °C


10/16/16
10/31/16
11/15/16
11/30/16
rth
Rio Grande South


and South of MRG MS4
18 Wet Season
/28/17
9/12/17
9/27/17
10/12/17
Date
Grande North
Rio Grande South

Data V&V - for Blanks and Duplicates

checked 1/13/17 SJG

Parameter	Sample Date: 8/10 to 8/11/16 Location: Rio Grande North & South Blank Results V&V
Total Suspended Solids (TSS)	OK, ND
Total Dissolved Solids (TDS)	OK, ND
Chemical Oxygen Demand (COD)	OK, < SDL
Biochemical Oxygen Demand (BOD_5)	OK, ND
Dissolved Oxygen (DO)	Field - N/A
Oil and Grease (N-Hexane Extractable Material)	OK, ND
E. coli	OK, < SDL
pH	Field - N/A
Total Kjedahl Nitrogen (TKN)	OK, ND
Nitrate plus Nitrite	OK, ND
Dissolved Phosphorous	OK, ND
Ammonia (mg/L as N)	OK, ND
Total Nitrogen	OK, ND
Total Phosphorous	OK, ND
PCBs (screening - used method 608)	OK, ND
PCBS (Method 1668A - sum of all congeners)	Method not used
Gross Alpha	OK, < SDL
Tetrahydrofuran	OK, ND
Benzo(a)pyrene	OK, ND
Benzo[b]fluoranthene (other name: 3,4-Benzofluoranthene)	OK, ND
Benzo(k)fluoranthene	OK, ND
Chrysene	OK, ND
Indeno(1,2,3-cd)Pyrene	OK, ND
Dieldrin	OK, ND
Pentachlorophenol	OK, ND
Benzidine	OK, ND
Benzo(a)anthracene	OK, ND
Dibenzofuran	OK, ND
Dibenz(a,h)anthracene	OK, ND
Chromium VI (Hexavalent)	OK, < SDL
Dissolved Copper	OK, ND
Dissolved Lead	OK, ND
Bis (2-ethyhexyl) Phthalate	OK, ND
Conductivity	Field - N/A
Temperature	Field - N/A
Hardness (as $CaCO_3$)	OK, ND

Note - field samples do not have lab blanks for duplicates to use for validation

checked 1/13/17 SJG	checked 1/13/17 SJG
Sample Date: 8/10 to 8/11/16 Location: Rio Grande North & South Duplicate Results V&V	Sample Date: 9/12 to 9/13/16 Location: Rio Grande North & South Blank Results V&V
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, < SDL
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	No Blank Reported
OK, RPD < 20%	OK, ND
No Duplicate Reported	OK, ND
Method not used	OK, < SDL
No Duplicate Reported	OK, < SDL
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
OK, RPD < 20%	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
Field - N/A	Field - N/A
OK, RPD < 20%	OK, ND

checked 1/13/17 SJG	**checked 1/13/17 SJG**
Sample Date: 9/12 to 9/13/16 Location: Rio Grande North & South Duplicate Results V&V	Sample Date: 9/21 to 9/22/16 Location: Rio Grande North & South Blank Results V&V
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, < SDL
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	Not Reported
No Duplicate Reported	OK, ND
No Duplicate Reported	No Blank Reported
OK, RPD < 20%	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
No Duplicate Reported	OK, < SDL
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
OK, RPD < 20%	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND

checked 1/13/17 SJG	checked 1/20/17 SJG
Sample Date: 9/21 to 9/22/16 Location: Rio Grande North & South Duplicate Results V&V	Sample Date: 11/21 to 11/22/16 Location: Rio Grande North & South Blank Results V&V
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, < SDL
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
Not Reported	Not Reported
No Duplicate Reported	OK, ND
No Duplicate Reported	No Blank Reported
OK, RPD < 20%	OK, ND
No Duplicate Reported	Not used
OK, RPD < 20%	OK, < SDL
No Duplicate Reported	OK, < SDL
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
OK, RPD < 20%	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, < SDL
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND

checked 1/20/17 SJG	checked 10/26/17 SJG
Sample Date: 11/21 to 11/22/16 Location: Rio Grande North & South Duplicate Results V&V	Sample Date: 7/27/17 to 7/28/17 Location: Rio Grande North & South Blank Results V&V
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, U - not detected
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, < PQL
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
Not Reported	Not Reported
No Duplicate Reported	OK, ND
No Duplicate Reported	Combo of TKN, Nitrate+Nitrite
OK, RPD < 20%	OK, ND
Not used	Not used
OK, RPD < 20%	met acceptance criteria
No Duplicate Reported	OK, < SDL
No Duplicate Reported	Not reported in table - analytical note
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	Not reported in table - analytical note
OK, RPD < 20%	OK, ND
No Duplicate Reported	Not reported in table - analytical note
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, U - not detected
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
OK, RPD < 20%	OK, ND
Field - N/A	Field - N/A
Field - N/A	Field - N/A
No Duplicate Reported	OK, ND

checked 10/26/17 SJG	checked 12/27/17 SJG
Sample Date: 7/27/17 to 7/28/17 Location: Rio Grande North & South Duplicate Results V&V	Sample Date: 9/27/17 to 9/28/17 Location: Rio Grande North & South Duplicate Results V&V
No Duplicate Reported	OK, MBLK ND
No Duplicate Reported	OK, MBLK ND
OK, RPD < 20%	OK, RPD < 20%
OK, RPD < 20%	OK, RPD < 20%
Field - N/A	Field - N/A
No Duplicate Reported	OK, MBLK ND
No Duplicate Reported	OK, MBLK < PQL
Field - N/A	Field - N/A
No Duplicate Reported	OK, MBLK ND
No Duplicate Reported	OK, MBLK ND
Not Reported	Not Reported
No Duplicate Reported	OK, MBLK ND
Combo of TKN, Nitrate+Nitrite	Combo of TKN, Nitrate+Nitrite
No Duplicate Reported	OK, RPD < 20%
Not used	Not used
met acceptance limits	met acceptance limits
No Duplicate Reported	Method Blank OK, no Duplicate reported
Not reported in table - analytical note	No Duplicate Reported/ Method Blank ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
Not reported in table - analytical note	OK, RPD < 20%
OK, RPD < 20%	OK, RPD < 20%
Not reported in table - analytical note	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
No Duplicate Reported	No Duplicate Reported, MBLK ND
OK, RPD < 20%	OK, RPD < 20%
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, ND
No Duplicate Reported	OK, RPD < 20%, blank reported 0.57 ug/L
Field - N/A	Field - N/A
Field - N/A	Field - N/A
No Duplicate Reported	No Duplicate Reported

DMR Copy of Record

Permit

Permit #:	**NMR04A016**	**Permittee:**	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)	**Facility:**	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL (AMAFCA)
Major:	No	**Permittee Address:**	2600 PROSPECT AVENUE NE ALBUQUERQUE, NM 87107	**Facility Location:**	2600 PROSPECT AVENUE NE ALBUQUERQUE, NM 87107
Permitted Feature:	001 External Outfall	**Discharge:**	**001-W** RIO GRANDE (NORTH) - WET SEASON		

Report Dates & Status

Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name:	Jerry	**Title:**	Executive Engineer	**Telephone:**	505-884-2215
Last Name:	Lovato				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample						=	23.47	=	23.47	=	23.47	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	247	=	247	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
00094	Conductivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample						=	6.73	=	6.73			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								<	2	<	2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	19.9	=	19.9	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample						=	7.37			=	7.37	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
00400	pH	1 - Effluent Gross	0	--	Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	32	=	32	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	5.17	=	5.17	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00556	Oil & Grease	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.05	=	0.05	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.062	=	0.062	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.025	=	0.025	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	1.1	=	1.1	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	5.5	=	5.5	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.0000001	=	0.0000001	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	20	=	20	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	181	=	181	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	2.06	=	2.06	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet Season Sample Date: 07/27/2017. This data applies to the CMC. EPA has approved this process for CMC members that delegate authority to AMAFCA. DMR data applies to following permits: NMR04A001; NMR04A002; NMR04A003; NMR04A004; NMR04A006; NMR04A007; NMR04A008; NMR04A010; NMR04A013; NMR04A015 and NMR04A016.

Attachments

No attachments.

Report Last Saved By

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)

User:	SGANLEYBHI
Name:	Sarah Ganley
E-Mail:	sganley@bhinc.com
Date/Time:	2018-03-29 09:30 (Time Zone: -05:00)

Report Last Signed By

User:	JLOVATO22
Name:	Jerry Lovato
E-Mail:	jlovato@amafca.org

Date/Time: 2018-10-05 13:59 (Time Zone: -05:00)

DMR Copy of Record

Permit					
Permit #:	**NMR04A016**	**Permittee:**	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)	**Facility:**	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL (AMAFCA)
Major:	No	**Permittee Address:**	2600 PROSPECT AVENUE NE ALBUQUERQUE, NM 87107	**Facility Location:**	2600 PROSPECT AVENUE NE ALBUQUERQUE, NM 87107
Permitted Feature:	002 External Outfall	**Discharge:**	**002-W** RIO GRANDE (SOUTH) - WET SEASON		
Report Dates & Status					
Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer					
First Name:	Jerry	**Title:**	Executive Engineer	**Telephone:**	505-884-2215
Last Name:	Lovato				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Sample						=	23.6	=	23.6	=	23.6	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00094	Conductivity	1 - Effluent Gross	0	--	Sample								=	361	=	361	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	6.8	=	6.8			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample								=	2	=	2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Sample								=	15	=	15	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	Sample						=	8.13			=	8.13	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample								=	63	=	63	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00556	Oil & Grease	1 - Effluent Gross	0	--	Sample								=	3.7	=	3.7	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.84	=	0.84	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample								=	0.88	=	0.88	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Sample								=	0.33	=	0.33	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Sample								=	0.25	=	0.25	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample								=	1.2	=	1.2	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.0000002	=	0.0000002	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	235.9	=	235.9	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	248	=	248	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	2.15	=	2.15	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet Season Sample Date: 07/28/2017. This data applies to the CMC. EPA has approved this process for CMC members that delegate authority to AMAFCA. DMR data applies to following permits: NMR04A001; NMR04A002; NMR04A003; NMR04A004; NMR04A006; NMR04A007; NMR04A008; NMR04A010; NMR04A013; NMR04A015 and NMR04A016.

Attachments

No attachments.

Report Last Saved By

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)

User:	SGANLEYBHI
Name:	Sarah Ganley
E-Mail:	sganley@bhinc.com
Date/Time:	2018-03-29 12:01 (Time Zone: -05:00)

Report Last Signed By

User:	JLOVATO22
Name:	Jerry Lovato
E-Mail:	jlovato@amafca.org

Date/Time: 2018-10-05 13:59 (Time Zone: -05:00)

DMR Copy of Record

Permit

Permit #: NMR04A016
Major: No
Permittee: ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)
Permittee Address: 2600 PROSPECT AVENUE NE
ALBUQUERQUE, NM 87107
Facility: ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL (AMAFCA)
Facility Location: 2600 PROSPECT AVENUE NE
ALBUQUERQUE, NM 87107
Permitted Feature: 001
External Outfall
Discharge: **001-WA**
RIO GRANDE (NORTH) - WET SEASON

Report Dates & Status

Monitoring Period: **From 07/01/17 to 10/31/17**
DMR Due Date: **12/01/18**
Status: **NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name: Jerry
Last Name: Lovato
Title: Executive Engineer
Telephone: 505-884-2215

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Sample						=	16.3	=	16.3	=	16.3	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00094	Conductivity	1 - Effluent Gross	0	--	Sample								=	103.4	=	103.4	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	7.13	=	7.13			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample								=	2	=	2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Sample								=	20.5	=	20.5	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	Sample						=	7.83			=	7.83	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample								=	260	=	260	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00556	Oil & Grease	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.84	=	0.84	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample								=	0.2	=	0.2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Sample								=	0.28	=	0.28	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Sample								=	0.029	=	0.029	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.95	=	0.95	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	3.06	=	3.06	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.0000002	=	0.0000002	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	733	=	733	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	225	=	225	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	2.91	=	2.91	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet Season Sample Date: 09/27/2017. This data applies to the CMC. EPA has approved this process for CMC members that delegate authority to AMAFCA. DMR data applies to following permits: NMR04A001; NMR04A002; NMR04A003; NMR04A004; NMR04A006; NMR04A007; NMR04A008; NMR04A010; NMR04A013; NMR04A015 and NMR04A016.

Attachments

No attachments.

Report Last Saved By

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)

User:	SGANLEYBHI
Name:	Sarah Ganley
E-Mail:	sganley@bhinc.com
Date/Time:	2018-03-29 10:02 (Time Zone: -05:00)

Report Last Signed By

User:	JLOVATO22
Name:	Jerry Lovato
E-Mail:	jlovato@amafca.org

Date/Time: 2018-10-05 13:59 (Time Zone: -05:00)

DMR Copy of Record

Permit					
Permit #:	**NMR04A016**	**Permittee:**	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)	**Facility:**	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL (AMAFCA)
Major:	No	**Permittee Address:**	2600 PROSPECT AVENUE NE ALBUQUERQUE, NM 87107	**Facility Location:**	2600 PROSPECT AVENUE NE ALBUQUERQUE, NM 87107
Permitted Feature:	002 External Outfall	**Discharge:**	**002-WA** RIO GRANDE (SOUTH) - WET SEASON		
Report Dates & Status					
Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer					
First Name:	Jerry	**Title:**	Executive Engineer	**Telephone:**	505-884-2215
Last Name:	Lovato				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample						=	15.2	=	15.2	=	15.2	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	**Permit Req.**							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	192.2	=	192.2	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
00094	Conductivity	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample						=	7.23	=	7.23			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	**Permit Req.**							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	5	=	5	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	36.2	=	36.2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample						=	7.92			=	7.92	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
00400	pH	1 - Effluent Gross	0	--	**Permit Req.**							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	810	=	810	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00530	Solids, total suspended	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
00556	Oil & Grease	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	1.7	=	1.7	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.46	=	0.46	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.74	=	0.74	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.08	=	0.08	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.98	=	0.98	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.47	=	0.47	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.000001	=	0.000001	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	6131	=	6131	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	260	=	260	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	20.9	=	20.9	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	**Permit Req.**									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet Season Sample Date: 09/28/2017. This data applies to the CMC. EPA has approved this process for CMC members that delegate authority to AMAFCA. DMR data applies to following permits: NMR04A001; NMR04A002; NMR04A003; NMR04A004; NMR04A006; NMR04A007; NMR04A008; NMR04A010; NMR04A013; NMR04A015 and NMR04A016.

Attachments

No attachments.

Report Last Saved By

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)

User:	SGANLEYBHI
Name:	Sarah Ganley
E-Mail:	sganley@bhinc.com
Date/Time:	2018-03-29 12:05 (Time Zone: -05:00)

Report Last Signed By

User:	JLOVATO22
Name:	Jerry Lovato
E-Mail:	jlovato@amafca.org

Date/Time: 2018-10-05 13:59 (Time Zone: -05:00)

DMR Copy of Record

Permit

Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	001 External Outfall	**Discharge:**	**001-D** ANGOSTURA DIVERSION DAM (NORTH) - DRY SEASON		

Report Dates & Status

Monitoring Period:	**From 11/01/17 to 06/30/18**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample															
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00094	Conductivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period						
					Sample															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00400	pH	1 - Effluent Gross	0	--	Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period				9 - Conditional Monitoring - Not Required This Period				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00556	Oil & Grease	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															

00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY MN		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
					Permit														02/PT - Twice Per Permit	CP -

39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		Term	COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
51040	E. coli	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
81302	Dibenzofuran	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY MN		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

No wet weather samples collected for FY17 Dry Season.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov
Date/Time:	2018-11-20 09:34 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov
Date/Time:	2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit

Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	001 External Outfall	**Discharge:**	**001-W** ANGOSTURA DIVERSION DAM (NORTH) - WET SEASON		

Report Dates & Status

Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample						=	23.47	=	23.47	=	23.47	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	247	=	247	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
00094	Conductivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample						=	6.73	=	6.73			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								<	2	<	2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	19.9	=	19.9	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample						=	7.37			=	7.37	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
00400	pH	1 - Effluent Gross	0	--	Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	32	=	32	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	5.17	=	5.17	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00556	Oil & Grease	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.05	=	0.05	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.062	=	0.062	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	0.025	=	0.025	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	1.1	=	1.1	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	5.5	=	5.5	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.0000001	=	0.0000001	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	20	=	20	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	181	=	181	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	2.06	=	2.06	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet season sample date: 07-27-2017. COA data matches CMC data submitted by AMAFCA.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov
Date/Time:	2018-11-20 09:34 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov

Date/Time: 2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit					
Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	001 External Outfall	**Discharge:**	**001-WA** ANGOSTURA DIVERSION DAM (NORTH) - WET SEASON		
Report Dates & Status					
Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).					
Principal Executive Officer					
First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Sample						=	16.3	=	16.3	=	16.3	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00094	Conductivity	1 - Effluent Gross	0	--	Sample								=	103.4	=	103.4	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	7.13	=	7.13			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample								=	2	=	2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Sample								=	20.5	=	20.5	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	Sample						=	7.83			=	7.83	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample								=	260	=	260	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00556	Oil & Grease	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.84	=	0.84	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample								=	0.2	=	0.2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Sample								=	0.28	=	0.28	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Sample								=	0.029	=	0.029	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.95	=	0.95	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	3.06	=	3.06	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.0000002	=	0.0000002	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	733	=	733	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	225	=	225	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	2.91	=	2.91	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet season sample date: 9/27/2017. The COA data submitted matches data submitted by AMAFCA.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	seaton@cabq.gov
Name:	Shellie Eaton
E-Mail:	seaton@cabq.gov
Date/Time:	2018-11-05 14:50 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov

Date/Time: 2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit

Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	001 External Outfall	**Discharge:**	**001-WB** ANGOSTURA DIVERSION DAM (NORTH) - WET SEASON		

Report Dates & Status

Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample															
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00094	Conductivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period						
					Sample															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00400	pH	1 - Effluent Gross	0	--	Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period				9 - Conditional Monitoring - Not Required This Period				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00556	Oil & Grease	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															

00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	19 - mg/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	19 - mg/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.		Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L	03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI		9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period			
					Sample						
					Permit					03/PT - Three Per Permit	CP -

39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		Term	COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Additional wet season sample not required for wet season 2017.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	seaton@cabq.gov
Name:	Shellie Eaton
E-Mail:	seaton@cabq.gov
Date/Time:	2018-11-05 14:57 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov
Date/Time:	2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit

Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	002 External Outfall	**Discharge:**	**002-D** ISLETA DIVERSION DAM (SOUTH) - DRY SEASON		

Report Dates & Status

Monitoring Period:	**From 11/01/17 to 06/30/18**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Sample															
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00094	Conductivity	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample															
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period						
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00400	pH	1 - Effluent Gross	0	--	Sample															
					Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period				9 - Conditional Monitoring - Not Required This Period				
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00556	Oil & Grease	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															

00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY MN	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.				Req Mon DAILY AV	Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI				9 - Conditional Monitoring - Not Required This Period	9 - Conditional Monitoring - Not Required This Period				
					Sample									
					Permit								02/PT - Twice Per Permit	CP -

39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		Term	COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		02/PT - Twice Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY MN		Req Mon DAILY MX	28 - ug/L		02/PT - Twice Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

No wet weather samples were collected during FY17 Dry Season.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	seaton@cabq.gov
Name:	Shellie Eaton
E-Mail:	seaton@cabq.gov
Date/Time:	2018-11-05 14:31 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov
Date/Time:	2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit

Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	002 External Outfall	**Discharge:**	**002-W** ISLETA DIVERSION DAM (SOUTH) - WET SEASON		

Report Dates & Status

Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	**Sample**						=	23.6	=	23.6	=	23.6	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00094	Conductivity	1 - Effluent Gross	0	--	**Sample**								=	361	=	361	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	**Sample**						=	6.8	=	6.8			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	**Sample**								=	2	=	2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	**Sample**								=	15	=	15	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	**Sample**						=	8.13			=	8.13	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	**Sample**								=	63	=	63	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00556	Oil & Grease	1 - Effluent Gross	0	--	**Sample**								=	3.7	=	3.7	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	**Sample**								=	0.84	=	0.84	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	**Sample**								=	0.88	=	0.88	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	**Sample**								=	0.33	=	0.33	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	**Sample**								=	0.25	=	0.25	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	**Sample**															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	**Sample**								=	1.2	=	1.2	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	**Sample**															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	**Sample**															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.0000002	=	0.0000002	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	235.9	=	235.9	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	248	=	248	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	2.15	=	2.15	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet season sample date: 07-28-2017. COA data matches data submitted by AMAFCA.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	seaton@cabq.gov
Name:	Shellie Eaton
E-Mail:	seaton@cabq.gov
Date/Time:	2018-11-05 14:44 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov

Date/Time: 2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit					
Permit #:	**NMR04A014**	**Permittee:**	CITY OF ALBUQUERQUE (COA)	**Facility:**	CITY OF ALBUQUERQUE MS4
Major:	No	**Permittee Address:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102	**Facility Location:**	ONE CIVIC PLAZA ALBUQUERQUE, NM 87102
Permitted Feature:	002 External Outfall	**Discharge:**	**002-WA** ISLETA DIVERSION DAM (SOUTH) - WET SEASON		

Report Dates & Status					
Monitoring Period:	**From 07/01/17 to 10/31/17**	**DMR Due Date:**	**12/01/18**	**Status:**	**NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer					
First Name:	Paula	**Title:**	Engineering Division Manager	**Telephone:**	505-768-2766
Last Name:	Dodge-Kwan				

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Sample						=	15.2	=	15.2	=	15.2	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00094	Conductivity	1 - Effluent Gross	0	--	Sample								=	192.2	=	192.2	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Sample						=	7.23	=	7.23			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Sample								=	5	=	5	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Sample								=	36.2	=	36.2	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	Sample						=	7.92			=	7.92	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample								=	810	=	810	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00556	Oil & Grease	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample								=	1.7	=	1.7	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample								=	0.46	=	0.46	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Sample								=	0.74	=	0.74	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Sample								=	0.08	=	0.08	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.98	=	0.98	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Sample								=	0.47	=	0.47	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS

					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample								=	0.000001	=	0.000001	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	6131	=	6131	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
51040	E. coli	1 - Effluent Gross	0	--	Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI															
					Sample								=	260	=	260	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample								=	20.9	=	20.9	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI															
					Sample															
81302	Dibenzofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				
					Sample															
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									B - Below Detection Limit/No Detection		B - Below Detection Limit/No Detection				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Wet Season Sample Date: 09-28-2017. The COA data submitted matches the data submitted by AMAFCA.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	seaton@cabq.gov
Name:	Shellie Eaton
E-Mail:	seaton@cabq.gov
Date/Time:	2018-11-05 14:55 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov

Date/Time:	2018-11-20 09:35 (Time Zone: -06:00)

DMR Copy of Record

Permit

Permit #: NMR04A014 | **Permittee:** CITY OF ALBUQUERQUE (COA) | **Facility:** CITY OF ALBUQUERQUE MS4

Major: No | **Permittee Address:** ONE CIVIC PLAZA, ALBUQUERQUE, NM 87102 | **Facility Location:** ONE CIVIC PLAZA, ALBUQUERQUE, NM 87102

Permitted Feature: 002 External Outfall | **Discharge:** **002-WB** ISLETA DIVERSION DAM (SOUTH) - WET SEASON

Report Dates & Status

Monitoring Period: **From 07/01/17 to 10/31/17** | **DMR Due Date:** **12/01/18** | **Status:** **NetDMR Validated**

Considerations for Form Completion

SEASONAL MONITORING PERIODS ARE: WET SEASON = JULY 1-OCT. 31 & DRY SEASON = NOV. 1-JUNE 30. SEPARATE DMRS REQUIRED FOR EACH SEASON. DMRS TO BE SUBMITTED DUE DEC. 1ST, FOLLOWING END OF MONIT. PERIOD. PERMIT REQUIRES A MIN. OF 7 EVENTS PER LOC. PER PERMIT TERM (3 WET SEASON, 2 DRY SEASON & 2 PERMITTEE'S CHOICE).

Principal Executive Officer

First Name: Paula | **Title:** Engineering Division Manager | **Telephone:** 505-768-2766

Last Name: Dodge-Kwan

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
					Sample															
00010	Temperature, water deg. centigrade	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV		Req Mon DAILY MX	04 - deg C		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00094	Conductivity	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	11 - umho/cm		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00300	Oxygen, dissolved [DO]	1 - Effluent Gross	0	--	Permit Req.							Req Mon DAILY MN		Req Mon DAILY AV			19 - mg/L		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period						
					Sample															
00310	BOD, 5-day, 20 deg. C	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00340	Oxygen demand, chem. [high level] [COD]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00400	pH	1 - Effluent Gross	0	--	Permit Req.							Req Mon MINIMUM				Req Mon MAXIMUM	12 - SU		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI							9 - Conditional Monitoring - Not Required This Period				9 - Conditional Monitoring - Not Required This Period				
					Sample															
00530	Solids, total suspended	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00556	Oil & Grease	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															

00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
00666	Phosphorus, dissolved	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
01032	Chromium, hexavalent [as Cr]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
01049	Lead, dissolved [as Pb]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34230	Benzo[b]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34242	Benzo[k]fluoranthene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34247	Benzo[a]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34320	Chrysene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34403	Indeno[1,2,3-cd]pyrene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34526	Benzo[a]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
34556	Dibenz[a,h]anthracene	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39032	Pentachlorophenol	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39100	Di[2-ethylhexyl] phthalate [DEHP]	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39120	Benzidine	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
39380	Dieldrin	1 - Effluent Gross	0	--	Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
					Sample															
					Permit														03/PT - Three Per Permit	CP -

39516	Polychlorinated biphenyls [PCBs]	1 - Effluent Gross	0	--	Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		Term	COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
51040	E. coli	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DA GEOAV		Req Mon DAILY MX	3Z - CFU/100mL		03/PT - Three Per Permit Term	GR - GRAB
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
70295	Solids, total dissolved	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	19 - mg/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
80029	Alpha gross radioactivity	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	17 - pCi/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
81302	Dibenzofuran	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				
81607	Tetrahydrofuran	1 - Effluent Gross	0	--	Sample															
					Permit Req.									Req Mon DAILY AV		Req Mon DAILY MX	28 - ug/L		03/PT - Three Per Permit Term	CP - COMPOS
					Value NODI									9 - Conditional Monitoring - Not Required This Period		9 - Conditional Monitoring - Not Required This Period				

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Additional wet season sample not required in 2017.

Attachments

No attachments.

Report Last Saved By

CITY OF ALBUQUERQUE (COA)

User:	seaton@cabq.gov
Name:	Shellie Eaton
E-Mail:	seaton@cabq.gov
Date/Time:	2018-11-05 14:58 (Time Zone: -06:00)

Report Last Signed By

User:	PDODGE-KWAN
Name:	Paula Dodge-Kwan
E-Mail:	pdodge-kwan@cabq.gov
Date/Time:	2018-11-20 09:35 (Time Zone: -06:00)

Cooperative Monitoring Compliance (CMC)
Waste Load Allocation (WLA) Calculation
FY 2017 - Wet & Dry Season Wet Weather Sampling
FY 2018 - Wet Season Wet Weather Sampling
Date: 12/20/17

Includes Edits From NMED 2/1/17 Meeting

FY 2017 - Wet Season Wet Weather Sampling for CMC - three qualifying event samples obtained:

August 10-11, 2016
September 12-13, 2016
September 21-22, 2016

FY 2017 - Dry Season Wet Weather Sampling for CMC - one qualifying event sample obtained:

November 21-22, 2016

FY 2018 - Wet Season Wet Weather Sampling for CMC - two qualifying events sample obtained:

July 27-28, 2017

References:

* NPDES General Permit No. NMR04A000, Dec. 22, 2014 with minor Permit modification on April 9, 2015
  WLA is defined in Part I.C.2.b.(i) - Discharges to Impaired Water Bodies with an Approved TMDL, p. 15 of Part I
  and in Appendix B of the Permit. Using Waste Load Allocation (WLA) as it related to stormwater.
* US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010
  Appendix F - Jurisdiction Area Approach
  This report defines the flow duration curves - which provide a "technical framework for identifying 'daily loads' in TMDL development" (p. 35).
  For Rio Grande Isleta Pueblo to Alameda Bridge - NMED used USGS gage 08330000 (Rio Grande at Alameda (Central)) - see Table D.2
  For Rio Grande Alameda Bridge to Angostura - NMED used USGS gage 0829928 (Rio Grande near Alameda) - see Table D.1
  The TMDL is calculated by multiplying the applicable WQ standard (Pueblo Geometric Mean x flow x conversions). WQ data not used in calc of TMDL - used in determining NMED integrated list
* AMAFCA Example E. coli loading calculation, July 6, 2016
* Nov. 4, 2015 E-mail from Sarah Holcomb, NMED SWQB to Middle Rio Grande MS4s with table of Load
  Allocations NMED calculated based on geographic area. This has an aggregate/combined WLA assigned for the
  current 12 CMC members. From 2/1/17 meeting - the flow regime in Sarah's e-mail needs to be modified to match
  the 2010 TMDL flow regimes for the Angostura to Alameda segment.
* Cooperative Monitoring Plan – MS4 Watershed-Based Permit, April 25, 2016
* Feb. 16, 2017 Phone call with Sarah Holcomb, Wayno Urbanos, and Heidi Henderson regarding the calculation
  of the percent of total E. coli loading applicable to the MS4s.
* March 2, 2017 e-mail from Sarah Holcomb stating agreement with approach to estimating the CMC's WLA contribution.
* April 18, 2017 e-mail from Nelly Smith, EPA Region 6 stating agreement with approach to estimating the CMC's WLA contribution.

Nov. 4, 2015 E-mail from Sarah Holcomb, NMED SWQB to Middle Rio Grande MS4s with table of Waste Load Allocations NMED calculated based on geographic area.

Below, please find the Waste Load Allocations NMED has calculated based on geographic area under the NPDES Watershed Based MS4 Permit for the Middle Rio Grande.
The aggregate/combined WLA assigned to the permittees working to sample cooperatively in accordance with the permit applies to:

Kirtland AFB, Sandia Labs/DOE and EXPO NM all indicated in their NOIs that they would be sampling individually and their individual WLAs are indicated below.
Please incorporate these numbers into your SWMPs and monitoring plans, as appropriate. If you have any questions or need more information, please let me know.

Alameda to Isleta	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	(>3,360 cfs)	(929-3,360 cfs)	(664-929 cfs)	(319-664 cfs)	(0-319 cfs)
Kirtland AFB	1.20E+11	3.01E+10	2.03E+10	7.46E+09	1.74E+09
Sandia Labs/DOE	2.08E+09	5.20E+08	3.50E+08	1.29E+08	2.99E+07
Combined WLA for Cooperative	2.51E+11	6.29E+10	4.22E+10	1.57E+10	3.42E+09
Total WLA	3.73E+11	9.35E+10	6.29E+10	2.33E+10	5.19E+09
CMC % of WLA	67%	67%	67%	67%	66%
Angostura to Alameda	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	(>3,670 cfs)	(922-3,670 cfs)	(647-922 cfs)	(359-647 cfs)	(0-359 cfs)
EXPO NM	6.23E+08	1.56E+08	1.05E+08	3.86E+07	8.98E+06
Combined WLA for Cooperative	3.14E+11	9.09E+10	No Value	3.24E+10	1.68E+10
Total WLA	3.15E+11	9.11E+10		3.25E+10	1.68E+10
CMC % of WLA	99.80%	99.83%	No Value	99.88%	99.95%

Flows from Figure 4.3 2010 TMDL Report, USGS 08330000 Rio Grande at Abq (Central)

Flows from Figure 4.4 2010 TMDL Report, USGS 08329928 Rio Grande near Alameda
Not used - from original e-mail - corrected on 2/1/17 with direction from Sarah Holcomb
From 2010 TMDL report - Figure 4.4, page 35

Note: BHI added the CMC % of WLA row

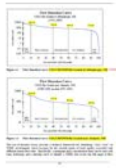


Table Author:

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Note - BHI -flow regime values listed above are from 2010 TMDL NMED report and are for the USGS 08330000 Rio Grande at Albuquerque, NM gage
There are slightly different values for the flow regimes for the southern segment (if using USGS 08329928 Rio Grande near Alameda, NM)
Refer to Tables 4.3 and 4.4 in 2010 TMDL NMED report.
Per discussion with Sarah Holcomb at NMED on 2/1/2017 - was given direction to use the 2010 TMDL report flow rates.

MS4 Values - updated using the E-mail Table above from Sarah Holcomb, NMED

Isleta to Alameda	High Conc	High	Moist Conc	Moist	Mid Conc	Mid	Dry Conc	Dry	Low Conc	Low
TMDL	5.27E+12		1.65E+12		9.03E+11		5.77E+11		1.90E+11	
ABCWUA	1.35E+11	2.56%	1.35E+11	8.2%	1.35E+11	15.0%	1.35E+11	23.4%	1.35E+11	70.7%
Sandia Peak Ski Co.	1.34E+07	0.00%	1.34E+07	0.0%	1.34E+07	0.0%	1.34E+07	0.0%	1.34E+07	0.0%
[illegible]	[illegible]	see below	[illegible]	see below	[illegible]	see below	[illegible]	see below	[illegible]	see below
[illegible]	[illegible]	see below	[illegible]	see below	[illegible]	see below	[illegible]	see below	[illegible]	see below
CMC WLA	2.51E+11	4.76%	6.29E+10	3.8%	4.22E+10	4.7%	1.57E+10	2.7%	3.42E+09	1.8%
Remaining MS4 WLA	1.22E+11	2.32%	3.06E+10	1.9%	2.07E+10	2.3%	7.59E+09	1.3%	1.77E+09	0.9%
Total WLA	5.08E+11	--	2.29E+11	--	1.98E+11	--	1.58E+11	--	1.40E+11	--
Load Allocation (Natural Background)	3.36E+12	63.78%	8.41E+11	51.1%	5.66E+11	62.7%	2.09E+11	36.2%	4.86E+10	25.5%
Margin of Safety	1.40E+12	26.58%	5.77E+11	35.0%	1.38E+11	15.3%	2.10E+11	36.4%	1.89E+09	1.0%
	Check %	100%	Check %	100%	Check %	100%	Check %	100%	Check %	100%

Per discussion on 2/16/17 with NMED - NMED provided agreement to use the percentage of CMC WLA to Total TMDL as an estimate of E. coli loading attributable to the CMC MS4s.
After review and consideration of NMED's input, agreed that the percentage of the CMC WLA to the Total TMDL minus the MOS was a reasonable way to estimate the
E. coli loading attributable to the CMC MS4s given the total E. coli loading in the Rio Grande.

Isleta to Alameda					
Flow Condition	High	Moist	Mid	Dry	Low
% of E. coli Loading in Rio Grande Estimated to be Attributed to the CMC	6.5%	5.9%	5.5%	4.3%	1.8%

Percentage Comparisons (following calculations in 2010 TMDL, Appendix F - this does not include the point sources in the comparison):

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Remaining MS4 compared to Natural Background	3.3%	3.3%	3.3%	3.3%	3.3%
Total	10.0%	10.0%	10.0%	10.0%	9.7%

As defined in the 2010 TMDL, App. F, Jurisdictional Area Approach - MS4s equal to the 10% in the TMDL. This percentage only relates to the natural background (loading allocation), not the total loading.

Alameda to Angostura	High Conc	High	Moist Conc	Moist	Mid Conc	Mid	Dry Conc	Dry	Low Conc	Low
TMDL	5.54E+12		1.61E+12		--	--	5.83E+11		2.94E+11	
Town of Bernalillo WWTP	1.42E+09	0.0%	1.42E+09	0.1%	--	--	1.42E+09	0.2%	1.42E+09	0.5%
CORR - No.2	9.80E+09	0.2%	9.80E+09	0.6%	--	--	9.80E+09	1.7%	9.80E+09	3.3%
CORR - No.3	1.51E+09	0.0%	1.51E+09	0.1%	--	--	1.51E+09	0.3%	1.51E+09	0.5%
[illegible]	[illegible]	see below	[illegible]	see below	--	--	[illegible]	see below	[illegible]	see below
[illegible]	[illegible]	see below	[illegible]	see below	--	--	[illegible]	see below	[illegible]	see below
CMC WLA	3.14E+11	5.7%	9.09E+10	5.6%	--	--	3.24E+10	5.6%	1.68E+10	5.7%
Remaining MS4 WLA	6.23E+08	0.0%	1.56E+08	0.0%	--	--	3.86E+07	0.0%	8.98E+06	0.0%
Total WLA	3.27E+11	--	1.04E+11	--	--	--	4.52E+10	--	2.96E+10	--
Load Allocation (Natural Background)	4.93E+12	89.1%	1.42E+12	88.6%	--	--	5.10E+11	87.5%	2.63E+11	89.5%
Margin of Safety	2.77E+11	5.0%	8.06E+10	5.0%	--	--	2.92E+10	5.0%	2.96E+09	1.0%
	Check %	100%	Check %	100%	Check %	0%	Check %	100%	Check %	100%

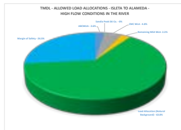
Per discussion on 2/16/17 with NMED - NMED provided agreement to use the percentage of CMC WLA to Total TMDL as an estimate of E. coli loading attributable to the CMC MS4s.
After review and consideration of NMED's input, decided that the percentage of the CMC WLA to the Total TMDL minus the MOS was a reasonable way to estimate the
E. coli loading attributable to the CMC MS4s given the total E. coli loading in the Rio Grande.

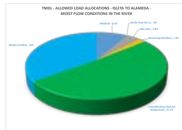
Alameda to Angostura					
Flow Condition	High	Moist	Mid	Dry	Low
% of E. coli Loading in Rio Grande Estimated to be Attributed to the CMC	6.0%	5.9%	--	5.9%	5.8%

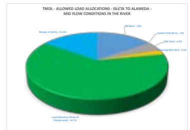
Percentage Comparisons (following calculations in 2010 TMDL, Appendix F):

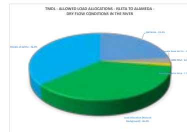
CMC MS4 WLA compared to Natural Background	6%	6%		6%	6%
Remaining MS4 compared to Natural Background	0%	0%		0%	0%
Total	6%	6%		6%	6%

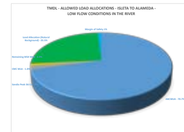
As defined in the 2010 TMDL, App. F, Jurisdictional Area Approach - MS4 equal to the 6% in the TMDL. This percentage only relates to the natural background (loading allocation), not the total loading.

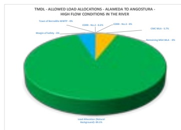


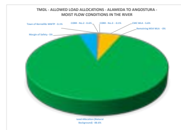


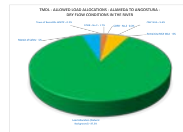


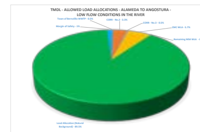












Compliance Monitoring Cooperative (CMC)
Summary of E. coli Loading Calculation Compared to Waste Load Allocation (WLA)

CMC Sample #	FY	Wet or Dry Season	Storm Event Date	Stream Segment	Stream Nan
1	FY 2017	Wet Season	8/10/2016	2105.1_00	***Alame*** Non-Pueblo Alameda Bridge Gran
			8/10/2016	2105_50	***Isle*** Isleta Pueblo Boundary to Grande at All
2	FY 2017	Wet Season	9/12/2016	2105.1_00	***Alame*** Non-Pueblo Alameda Bridge Gran
			9/12/2016	2105_50	***Isle*** Isleta Pueblo Boundary to Grande at All
3	FY 2017	Wet Season	9/21/2016	2105.1_00	***Alame*** Non-Pueblo Alameda Bridge Gran
			9/21/2016	2105_50	***Isle*** Isleta Pueblo Boundary to Grande at All
4	FY 2017	Dry Season	11/21/2016	2105.1_00	***Alame*** Non-Pueblo Alameda Bridge Gran
			11/21/2016	2105_50	***Isle*** Isleta Pueblo Boundary to Grande at All
5	FY 2018	Wet Season	7/27/2017	2105.1_00	***Alame*** Non-Pueblo Alameda Bridge Gran
			7/27/2017	2105_50	***Isle*** Isleta Pueblo Boundary to Grande at All
6	FY 2018	Wet Season	9/27/2017	2105.1_00	***Alame*** Non-Pueblo Alameda Bridge Gran
			9/27/2017	2105_50	***Isle*** Isleta Pueblo Boundary to Grande at All

ne / Related USGS Gage	Total E. coli Loading in River Exceeds TMDL for River?	Estimated CMC E. coli Loading (CFU/day) for Each Segment	Daily Mean Flow (cfs)
eda to Angostura to Angostura Diversion / 08329928 - Rio de near Alameda	Yes	8.32E+11	639
ta to Alameda Alameda Street Bridge / 0833000 - Rio buquerque, NM (Central)	Yes	2.34E+11	703
eda to Angostura to Angostura Diversion / 08329928 - Rio de near Alameda	Yes	4.67E+11	435
ta to Alameda Alameda Street Bridge / 0833000 - Rio buquerque, NM (Central)	Yes	1.02E+11	467
eda to Angostura to Angostura Diversion / 08329928 - Rio de near Alameda	Yes	1.29E+11	350
ta to Alameda Alameda Street Bridge / 0833000 - Rio buquerque, NM (Central)	Yes	1.22E+10	251
eda to Angostura to Angostura Diversion / 08329928 - Rio de near Alameda	No	--	710
ta to Alameda Alameda Street Bridge / 0833000 - Rio buquerque, NM (Central)	Yes	1.68E+12	881
eda to Angostura to Angostura Diversion / 08329928 - Rio de near Alameda	No	2.50E+10	545
ta to Alameda Alameda Street Bridge / 0833000 - Rio buquerque, NM (Central)	Yes	8.63E+10	470
eda to Angostura to Angostura Diversion / 08329928 - Rio de near Alameda	Yes	7.34E+12	983
ta to Alameda Alameda Street Bridge / 0833000 - Rio buquerque, NM (Central)	Yes	2.18E+12	1,190

Flow Conditions	WLA for CMC Based on Flow Conditions & Stream Segment (CFU/day)	WLA - Potential Exceedance or Acceptable	Delta - E. coli Loading Minus WLA (CFU/day)
Dry	3.24E+10	WLA Potential Exceedance	8.00E+11
Mid	4.22E+10	WLA Potential Exceedance	1.92E+11
Dry	3.24E+10	WLA Potential Exceedance	4.35E+11
Dry	1.57E+10	WLA Potential Exceedance	8.62E+10
Low	1.68E+10	WLA Potential Exceedance	1.13E+11
Low	3.42E+09	WLA Potential Exceedance	8.74E+09
Mid	No Value	WLA Acceptable	--
Mid	4.22E+10	WLA Potential Exceedance	1.63E+12
Dry	3.24E+10	WLA Acceptable	-7.46E+09
Dry	1.57E+10	WLA Potential Exceedance	7.06E+10
Moist	9.09E+10	WLA Potential Exceedance	7.25E+12
Moist	6.29E+10	WLA Potential Exceedance	2.11E+12

Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Wet Season Wet Weather Sampling

Date: 2/22/17

Storm Event Date: 8/10/2016

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North	35.9	8/10/2016 12:50 PM	8/10/2016 1:50 PM
Rio Grande South	1,106	8/11/2016 11:30 AM	8/11/2016 1:00 PM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1608623
2. HEAL lab report for Rio Grande South: Order number 1608678
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method for units of MPN/100 mL, lab report uses units CFU/100 mL, for this analysis it was assumed that the two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 8/10/16	Daily Mean Flow (cfs) 8/11/16	Calculated Mean Flow (cfs) from 8/10/16 11:30 AM to 8/11/16 11:30 AM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	639	500	593	639
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	669	525	703	703

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/14/16.
2. Since this storm spans 2 days - BHI also checked mean flow by calculating mean flow from 11:30 AM on 8/10/16 to 11:30 AM on 8/11/16.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	--	Storm Event Flow Condition	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	Storm Event Flow Condition	--	--
		High	Moist	Mid	Dry	Low

Notes:
1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	35.9	639	5.61E+11
Rio Grande South	1,106	703	1.90E+13
Delta in E. coli Loading Between North and South Locations			1.85E+13

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x \text{ Mean Daily Flow } \left(\frac{ft^3}{sec}\right) \text{ x } 3{,}600 \left(\frac{sec}{hr}\right) \text{ x } 24 \left(\frac{hr}{day}\right) = \text{E. coli Loading } \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, ratios need to be applied to the E. coli loading. The areas used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda to Angostura segment = 1,612.72 sq. mi. with the total contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determination is not an additive determination - the WLA considers each stream segment separately - so even though the north segment flows into the south segment, the WLA, and therefore the E. coli loading, looks at each segment independently.

$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angostura

$1\ - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA values. This approach uses percentages 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77	1.42E+13	5.83E+11	TMDL Exceeded
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23	4.25E+12	9.03E+11	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply Percent based on CMC WLA compared to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with CMC Members	Total CMC E. coli Loading (CFU/day) for Each Segment
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Dry	5.9%	8.32E+11
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Mid	5.5%	2.34E+11

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

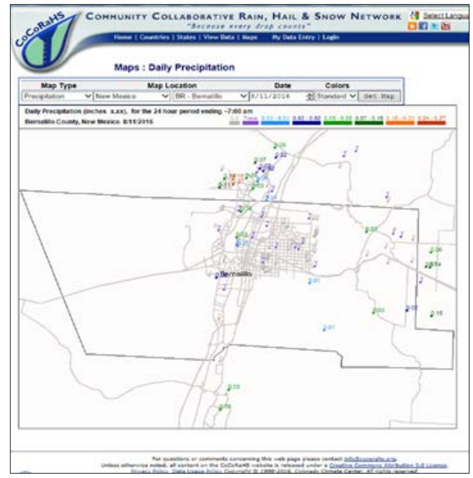
Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	8.32E+11	Dry	3.24E+10	WLA Potential Exceedance
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	2.34E+11	Mid	4.22E+10	WLA Potential Exceedance

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

Rainfall Data - CoCoRaHS.org



It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Wet Season Wet Weather Sampling

Date: 2/22/17

Storm Event Date: 9/12/2016

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North	55.6	9/12/2016 11:00 AM	9/12/2016 1:10 PM
Rio Grande South	959	9/13/2016 7:15 AM	9/13/2016 10:30 AM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1609527
2. HEAL lab report for Rio Grande South: Order number 1609609
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method for units of MPN/100 mL, lab report uses units CFU/100 mL, for this analysis assuming two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 9/12/16	Daily Mean Flow (cfs) 9/13/16	Calculated Mean Flow (cfs) from 9/12/16 11:45 AM to 9/13/16 11:45 AM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	435	380	409	435
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	467	354	381	467

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/14/16.
2. Since this storm spans 2 days - BHI checked mean flow by calculating mean flow from the time of collection at 11:45 AM on 9/12/16 to 11:45 AM on 9/13/16.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	--	Storm Event Flow Condition	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	--	Storm Event Flow Condition	--
		High	Moist	Mid	Dry	Low

Notes:
1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	55.6	435	5.92E+11
Rio Grande South	959	467	1.10E+13
Delta in E. coli Loading Between North and South Locations			1.04E+13

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation:

$$E.\,Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x\ \text{Mean Daily Flow}\ \left(\frac{ft^3}{sec}\right) \text{x}\ 3{,}600\ \left(\frac{sec}{hr}\right) \text{x}\ 24\ \left(\frac{hr}{day}\right) = \text{E. coli Loading}\ \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, ratios need to be applied to the E. coli loading. The areas used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda to Angostura segment = 1,612.72 sq. mi. with the total contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determination is not an additive determination - the WLA considers each stream segment separately - so even though the north segment flows into the south segment, the WLA, and therefore the E. coli loading, looks at each segment independently.

$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angostura
$1\ - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA values. This approach uses percentages 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77	7.98E+12	5.83E+11	TMDL Exceeded
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23	2.38E+12	5.77E+11	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply % based on WLA compared to total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with MS4s	Total MS4 E. coli Loading (CFU/day) for Each Segment
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Dry	5.9%	4.67E+11
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Dry	4.3%	1.02E+11

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

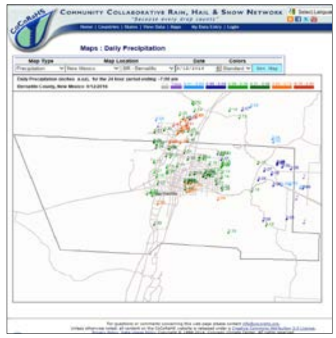
Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	*Alameda to Angostura* Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	4.67E+11	Dry	3.24E+10	WLA Potential Exceedance
2105_50	*Isleta to Alameda* Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	1.02E+11	Dry	1.57E+10	WLA Potential Exceedance

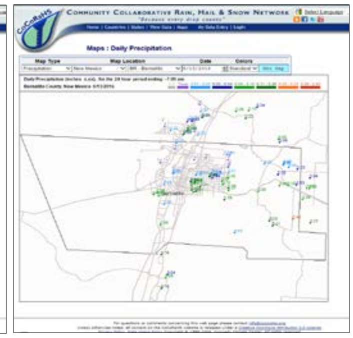
Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Rainfall Data - CoCoRaHS.org





Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Wet Season Wet Weather Sampling

Date: 2/22/17

Storm Event Date: 9/21/2016

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North	31.1	9/21/2016 12:15 PM	9/21/2016 2:00 PM
Rio Grande South	517	9/22/2016 11:00 AM	9/22/2016 3:50 PM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1609B94
2. HEAL lab report for Rio Grande South: Order number 1609C98
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method for units of MPN/100 mL, lab report uses units CFU/100 mL, for this analysis assuming two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 9/21/16	Daily Mean Flow (cfs) 9/22/16	Calculated Mean Flow (cfs) from 9/21/16 11:00 AM to 9/22/16 11:00 AM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	327	350	333	350
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	251	250	251	251

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/15/16.
2. Since this storm spans 2 days - BHI checked mean flow by calculating mean flow from the time of collection at 12:15 PM on 9/21/16.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	--	--	Storm Event Flow Condition
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	--	--	Storm Event Flow Condition
		High	Moist	Mid	Dry	Low

1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	31.1	350	2.66E+11
Rio Grande South	517	251	3.18E+12
Delta in E. coli Loading Between North and South Locations			2.91E+12

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x \text{ Mean Daily Flow } \left(\frac{ft^3}{sec}\right) \text{ x } 3{,}600 \left(\frac{sec}{hr}\right) \text{ x } 24 \left(\frac{hr}{day}\right) = \text{E. coli Loading } \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, ratios need to be applied to the E. coli loading. The areas used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda to Angostura segment = 1,612.72 sq. mi. with the total contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determination is not an additive determination - the WLA considers each stream segment separately - so even though the north segment flows into the south segment, the WLA, and therefore the E. coli loading, looks at each segment independently.

$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angostura
$1 - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA values. This approach uses percentages 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77	2.24E+12	2.94E+11	TMDL Exceeded
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23	6.69E+11	1.90E+11	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply % based on WLA compared to total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with MS4s	Total MS4 E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Low	5.8%	1.29E+11
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Low	1.8%	1.22E+10

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

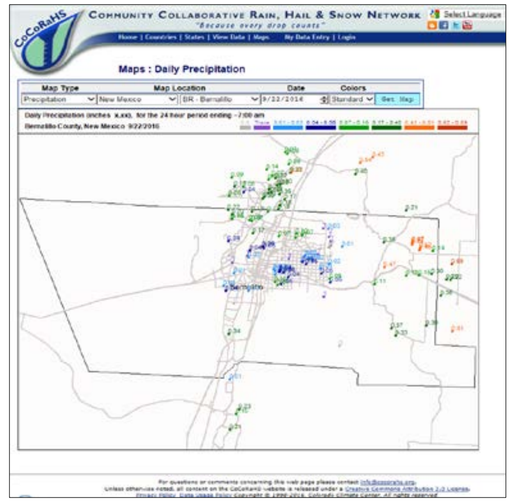
Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	1.29E+11	Low	1.68E+10	WLA Potential Exceedance
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	1.22E+10	Low	3.42E+09	WLA Potential Exceedance

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Rainfall Data - CoCoRaHS.org



Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Dry Season Wet Weather Sampling

Date: 2/6/17

Storm Event Date: 11/21/2016

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North	43.5	11/21/2016 9:30 AM	11/21/2016 11:20 AM
Rio Grande South	7,270	11/22/2016 7:00 AM	11/22/2016 9:15 AM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1611B12
2. HEAL lab report for Rio Grande South: Order number 1611B75
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method for units of MPN/100 mL, lab report uses units CFU/100 mL, for this analysis assuming two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 11/21/16	Daily Mean Flow (cfs) 11/22/16	Calculated Mean Flow (cfs) from 11/21/16 9:30 AM to 11/22/16 9:30 AM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	639	659	710	710
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	722	881	853	881

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/15/16.
2. Since this storm spans 2 days - BHI checked mean flow by calculating mean flow from the time of collection at 9:30 AM on 11/21/16.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	Storm Event Flow Condition	--	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	Storm Event Flow Condition	--	--
		High	Moist	Mid	Dry	Low

1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	43.5	710	7.56E+11
Rio Grande South	7,270	881	1.57E+14
Delta in E. coli Loading Between North and South Locations			1.56E+14

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation (per day):

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x \text{ Mean Daily Flow } \left(\frac{ft^3}{sec}\right) \text{ x } 3{,}600 \left(\frac{sec}{hr}\right) \text{ x } 24 \left(\frac{hr}{day}\right) = \text{E. coli Loading } \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, ratios need to be applied to the E. coli loading. The areas used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda to Angostura segment = 1,612.72 sq. mi. with the total contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determination is not an additive determination - the WLA considers each stream segment separately - so even though the north segment flows into the south segment, the WLA, and therefore the E. coli loading, looks at each segment independently.

$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angostura
$1 - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA values. This approach uses percentages 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77	1.20E+14	--	TMDL Not Exceeded
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23	3.59E+13	9.03E+11	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply % based on WLA compared to total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with MS4s	Total MS4 E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Mid	--	--
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Mid	4.7%	1.68E+12

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

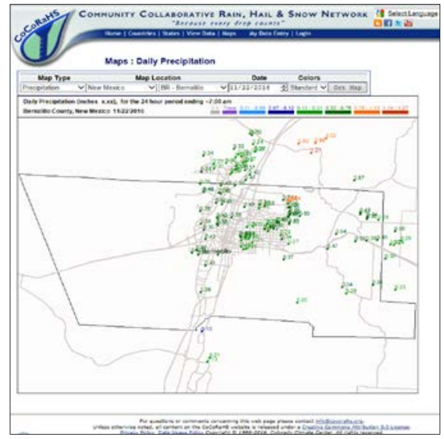
Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	Mid	No Value	WLA Acceptable
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	1.68E+12	Mid	4.22E+10	WLA Potential Exceedance

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Rainfall Data - CoCoRaHS.org



Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2018 - Wet Season Wet Weather Sampling

Date: 12/19/17

Storm Event Date: 7/27/2017

Calculated following CMC monitoring procedure and using only Rio Grande North and South E. coli sample results. Results in this Worksheet were not used for Memo reporting - see next tab - used results with Alameda sample.

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North	20	7/27/2017 12:30 PM	7/27/2017 1:30 PM
Rio Grande South	236	7/28/2017 8:45 AM	7/28/2017 10:47 AM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1707E07
2. HEAL lab report for Rio Grande South: Order number 1707E46
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method uses units of MPN/100 mL, WLA calculations use CFU/100 mL, for this analysis it was assumed that the two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 7/27/17	Daily Mean Flow (cfs) 7/28/17	Calculated Mean Flow (cfs) from 7/27/17 12:30 PM to 7/28/17 12:30 PM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	465	545	496	545
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	414	470	425	470

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/19/17.
2. Since this storm spans 2 days - BHI also checked mean flow by calculating mean flow from 12:30 PM on 7/27/17 to 12:30 PM on 7/28/17.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	--	Storm Event Flow Condition	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	--	Storm Event Flow Condition	--
		High	Moist	Mid	Dry	Low

Notes:
1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	20.0	545	2.67E+11
Rio Grande South	236	470	2.71E+12
Delta in E. coli Loading Between North and South Locations			2.45E+12

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x\ \text{Mean Daily Flow}\ \left(\frac{ft^3}{sec}\right) \text{x}\ 3{,}600\ \left(\frac{sec}{hr}\right) \text{x}\ 24\ \left(\frac{hr}{day}\right) = \text{E. coli Loading}\ \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme does not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. However, for this storm event, an E. coli sample was obtained at the Alameda Bridge.

For this storm - calculations will be done two ways - 1) using the area approach, as has been done with prior CMC samples and 2) busing the Alameda sample to determine the north and south segment loads.

For the area approach, to determine the E. coli loading for the northern and southern stream segments, ratios need to be applied to the E. coli loading. The areas used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda to Angostura segment = 1,612.72 sq. mi. with the total contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the LA determination is not an additive determination - the LA considers each stream segment separately - so even though the north segment flows into the south segment, the LA, and therefore the E. coli loading, looks at each segment independently.

$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angostura

$1\ - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the LA values. This approach uses percentages that calculate a percentage of the CMC LA 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77	1.88E+12	5.83E+11	TMDL Exceeded
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23	5.63E+11	5.77E+11	TMDL Not Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply Percent based on CMC WLA compared to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with CMC Members	Total CMC E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Dry	5.9%	1.10E+11
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Dry	4.3%	2.40E+10

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

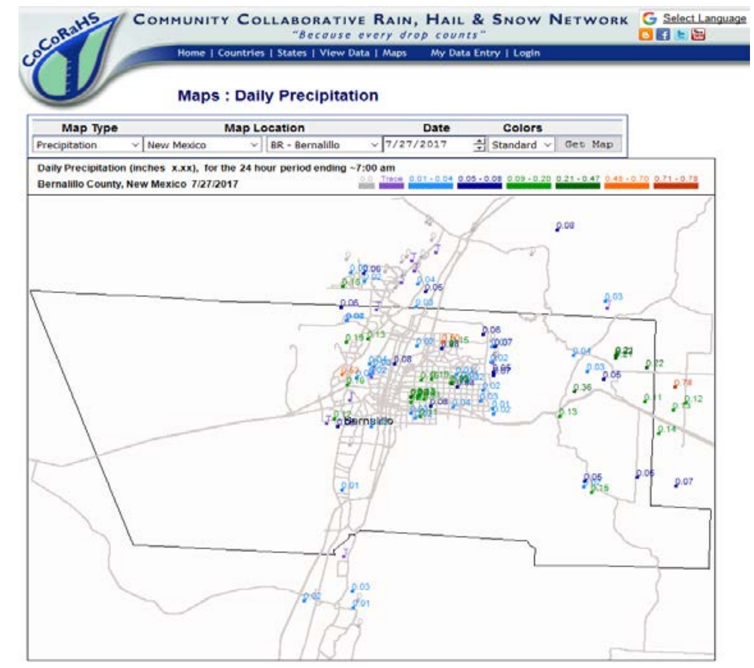
Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	1.10E+11	Dry	3.24E+10	WLA Potential Exceedance
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	2.40E+10	Dry	1.57E+10	WLA Potential Exceedance

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Rainfall Data - CoCoRaHS.org



Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2018 - Wet Season Wet Weather Sampling

Date: 12/19/17

Storm Event Date: 7/27/2017

Calculated using the sample results obtained from The Rio Grande at Alameda (division point between Rio Grande North and South segments), This is different than the regular CMC calculation, since the mid-point E. coli sample is not a part of the CMC Monitoring Plan.

Rainfall Data - CoCoRaHS.org

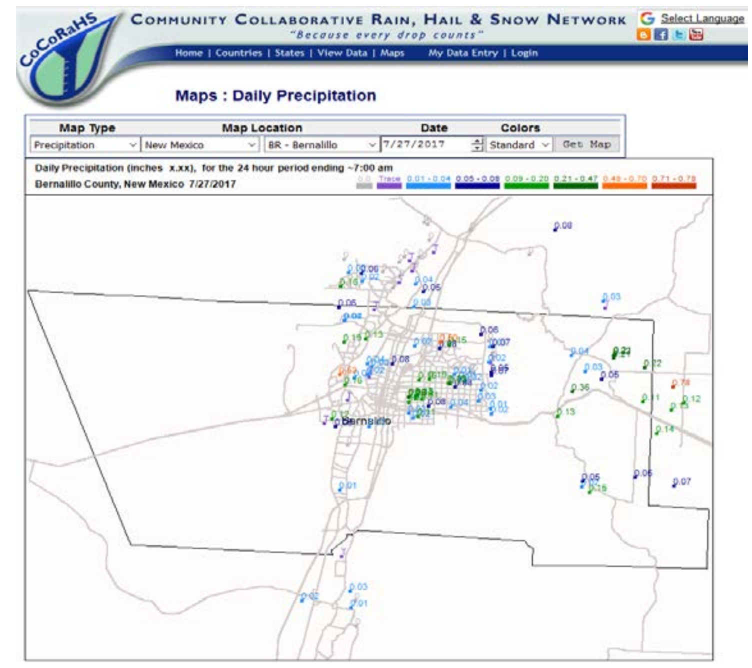


Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL	
Rio Grande North	20	7/27/2017 12:30 PM	7/27/2017 1:30 PM	
Rio Grande at Alameda	52	7/27/2017 10:30 PM	7/27/2017 10:47 PM	* Sample tested at the Bernalillo WWTP
Rio Grande South	236	7/28/2017 8:45 AM	7/28/2017 10:47 AM	

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1707E07
2. HEAL lab report for Rio Grande South: Order number 1707E46
3. Alameda sample collected at tested at the Bernalillo WWTP
4. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method uses units of MPN/100 mL, WLA calculations use CFU/100 mL, for this analysis it was assumed that the two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 7/27/17	Daily Mean Flow (cfs) 7/28/17	Calculated Mean Flow (cfs) from 7/27/17 12:30 PM to 7/28/17 12:30 PM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	465	545	496	545
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	414	470	425	470

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/19/17.
2. Since this storm spans 2 days - BHI also checked mean flow by calculating mean flow from 12:30 PM on 7/27/17 to 12:30 PM on 7/28/17.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	--	Storm Event Flow Condition	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	--	Storm Event Flow Condition	--
		High	Moist	Mid	Dry	Low

Notes:
1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)	
Rio Grande North	20	545	2.67E+11	
Rio Grande at Alameda	52	545	6.93E+11	
Delta in E. coli Loading Between North and Alameda Locations - This is the E. coli Loading for the Northern Segment			4.27E+11	* If loading is negative, the delta will default to zero.
Rio Grande South	236	470	2.71E+12	
Delta in E. coli Loading Between Alameda and South Locations - This is the E. coli Loading for the Southern Segment			2.02E+12	* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.
2. Used Rio Grande near Alameda gage for the flow rate at Alameda.

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x\ \text{Mean Daily Flow}\ \left(\frac{ft^3}{sec}\right) \text{x}\ 3{,}600\ \left(\frac{sec}{hr}\right) \text{x}\ 24\ \left(\frac{hr}{day}\right) = \text{E. coli Loading}\ \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme does not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. However, for this storm event, an E. coli sample was obtained at the Alameda Bridge.

For this storm - calculations will be done two ways - 1) using the area approach, as has been done with prior CMC samples and 2) busing the Alameda sample to determine the north and south segment loads.

See previous worksheet for the area approach.

In Table 6 - An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the LA values. This approach uses percentages that calculate a percentage of the CMC LA 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Not Applicable - Have a Mid Point Sample	4.27E+11	5.83E+11	TMDL Not Exceeded
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Not Applicable - Have a Mid Point Sample	2.02E+12	5.77E+11	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Calculated using the sample results obtained from The Rio Grande at Alameda (division point between Rio Grande North and South segments), This is different than the regular CMC calculation, since the mid-point E. coli sample is not a part of the CMC Monitoring Plan.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply Percent based on CMC WLA compared to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with CMC Members	Total CMC E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Dry	5.9%	2.50E+10
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Dry	4.3%	8.63E+10

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	2.50E+10	Dry	3.24E+10	WLA Acceptable
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	8.63E+10	Dry	1.57E+10	WLA Potential Exceedance

Using the mid-point Alameda sample results, the LA is acceptable for the northern segment.

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2018 - Wet Season Wet Weather Sampling

Date: 12/19/17

Storm Event Date: 9/27/2017

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North	733	9/27/2017 12:00 PM	9/27/2017 12:30 PM
Rio Grande South	6,131	9/28/2017 9:00 AM	9/28/2017 1:40 PM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1709F09
2. HEAL lab report for Rio Grande South: Order number 1709F81
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method uses units of MPN/100 mL, LA calculations use CFU/100 mL, for this analysis it was assumed that the two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 9/27/17	Daily Mean Flow (cfs) 9/28/17	Calculated Mean Flow (cfs) from 9/27/17 12:00 PM to 9/28/17 12:00 PM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	744	979	983	983
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	643	1,190	985	1,190

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/19/17.
2. Since this storm spans 2 days - BHI also checked mean flow by calculating mean flow from 12:00 PM on 9/27/17 to 12:00 PM on 9/28/17.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	Storm Event Flow Condition	--	--	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	Storm Event Flow Condition	--	--	--
		High	Moist	Mid	Dry	Low

Notes:
1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	733	983	1.76E+13
Rio Grande South	6,131	1,190	1.78E+14
Delta in E. coli Loading Between North and South Locations			1.61E+14

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x \text{ Mean Daily Flow } \left(\frac{ft^3}{sec}\right) \text{ x } 3{,}600 \left(\frac{sec}{hr}\right) \text{ x } 24 \left(\frac{hr}{day}\right) = \text{E. coli Loading } \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, ratios need to be applied to the E. coli loading. The areas used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda to Angostura segment = 1,612.72 sq. mi. with the total contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determination is not an additive determination - the WLA considers each stream segment separately - so even though the north segment flows into the south segment, the WLA, and therefore the E. coli loading, looks at each segment independently.

$$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.} = 0.77 \text{ or 77\% for the north segment - Alameda to Angostura}$$

$$1\ - 0.77 = 0.23 \text{ or 23\% for the south segment - Isleta to Alameda}$$

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA values. This approach uses percentages 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77	1.24E+14	1.61E+12	TMDL Exceeded
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23	3.70E+13	1.65E+12	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply Percent based on CMC WLA compared to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with CMC Members	Total CMC E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Moist	5.9%	7.34E+12
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Moist	5.9%	2.18E+12

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

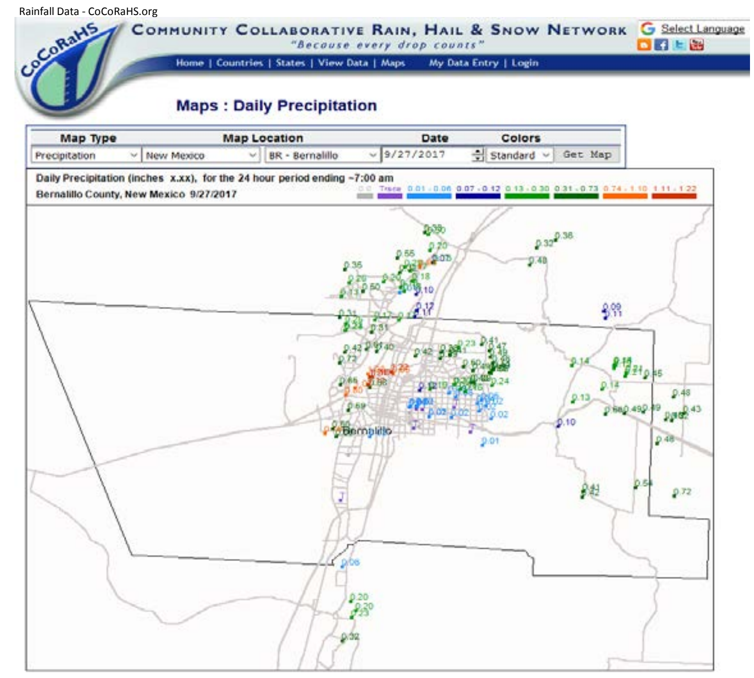
Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	7.34E+12	Moist	9.09E+10	WLA Potential Exceedance
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	2.18E+12	Moist	6.29E+10	WLA Potential Exceedance

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Rainfall Data - CoCoRaHS.org



Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2018 - Wet Season Wet Weather Sampling

Calculated using the pre-storm sample results obtained from the Rio Grande. Checking - Is TMDL exceeded even before the storm begins? Also, have an Alameda sample for pre-storm.

Date: 12/19/17

Storm Event Date: 9/27/2017

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North (Pre-Storm)	733	9/27/2017 12:00 PM	9/27/2017 12:30 PM
Rio Grande at Alameda (Pre-Storm)	218	9/27/2017 10:30 AM	9/27/2017 10:54 AM
Rio Grande South (Pre-Storm)	2,359	9/27/2017 12:00 PM	9/27/2017 3:00 PM

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1709F09
2. HEAL lab report for Rio Grande South: Order number 1709F32
3. HEAL lab report for Rio Grande at Alameda (pre-stprm): Order number 1709F01
4. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method uses units of MPN/100 mL, LA calculations use CFU/100 mL, for this analysis it was assumed that the two units are equivalent based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) enumeration methods and probable standards reporting revision" and discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location	Daily Mean Flow (cfs) 9/26/17	Daily Mean Flow (cfs) 9/27/17	Calculated Mean Flow (cfs) from 9/27/17 12:00 AM to 9/27/17 12:00 PM	Maximum Flow Used for this Analysis (cfs)
Rio Grande North	08329928 - Rio Grande near Alameda	524	744	513	744
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Central)	519	643	530	643

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/19/17.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report				
		High (>3,670 cfs)	Moist (922-3,670 cfs)	Mid (647-922 cfs)	Dry (359-647 cfs)	Low (0-359 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	--	Storm Event Flow Condition	--	--
		High (>3,360 cfs)	Moist (929-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--	--	--	Storm Event Flow Condition	--
		High	Moist	Mid	Dry	Low

Notes:
1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sarah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17 NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, Figures 4.3 and 4.4.

Table 4
Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	733	744	1.33E+13
Rio Grande at Alameda	218	744	3.97E+12
Delta in E. coli Loading Between North and Alameda Locations - This is the E. coli Loading for the Northern Segment			0.00E+00
Rio Grande South	2,359	643	3.71E+13
Delta in E. coli Loading Between Alameda and South Locations - This is the E. coli Loading for the Southern Segment			3.31E+13

* If loading is negative, the delta will default to zero.

Notes:
1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a daily basis by NMED and EPA.

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x \text{ Mean Daily Flow } \left(\frac{ft^3}{sec}\right) \text{ x } 3{,}600 \left(\frac{sec}{hr}\right) \text{ x } 24 \left(\frac{hr}{day}\right) = \text{E. coli Loading } \left(\frac{CFU}{day}\right)$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading must be reduced to only represent the estimated CMC MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).
The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permittees, which no longer applies. NMED provided an e-mail that applies to the current CMC MS4 members and remaining MS4 members.
The CMC monitoring scheme does not have an interim E. coli sample at the Alameda Bridge during collection of this sample, which is the division of the two stream segments. However, for this storm event, an E. coli sample was obtained at the Alameda Bridge.
For this storm - calculations will be done two ways - 1) using the area approach, as has been done with prior CMC samples and 2) busing the Alameda sample to determine the north and south segment loads.
See previous worksheet for the area approach.

In Table 6 - An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the LA values. This approach uses percentages that calculate a percentage of the CMC LA 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.

Table 5
Calculate E. coli Loading Per Stream Segment Reach and Compare to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment	E. coli Loading (CFU/day) for Each Segment	Total TMDL for Segment	TMDL Exceedance?
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Not Applicable - Have a Mid Point Sample	0.00E+00	--	TMDL Not Exceeded
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Not Applicable - Have a Mid Point Sample	3.31E+13	5.77E+11	TMDL Exceeded

1. Compares the E. coli loading to the TMDL - the E. coli loading represents all of the E. coli sources and not just the CMC MS4. The TMDL could be from any source and this analysis cannot distinguish between sources.

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply Percent based on CMC WLA compared to Total TMDL:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions	Percent of E. coli Associated with CMC Members	Total CMC E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Mid	--	--
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Dry	4.3%	1.42E+12

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared to total TMDL minus the MOS.
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC WLA compared to the TMDL minus the Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discussed this approach with NMED on 2/16/17.

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

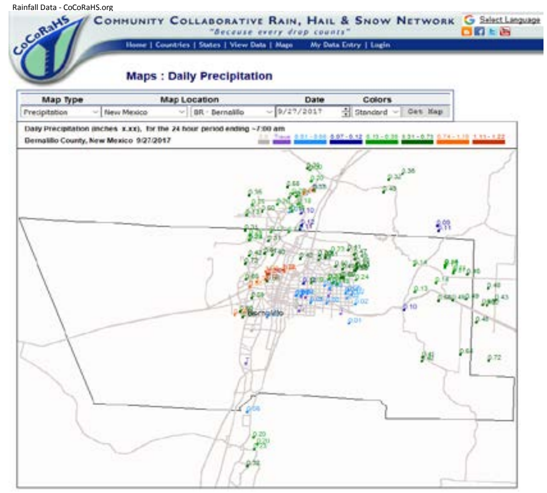
Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for Flow Conditions	WLA - Potential Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--	Mid	No Value	WLA Acceptable
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	1.42E+12	Dry	1.57E+10	WLA Potential Exceedance

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Rainfall Data - CoCoRaHS.org



Cooperative Monitoring Compliance (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Wet Season Wet Weather Sampling

Date: 2/6/17

Storm Event Date: 7/6/2016 - Example provided by AMAFCA for original WLA calcul

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)[3]
Rio Grande North	41
Rio Grande South	246

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number________
2. HEAL lab report for Rio Grande South: Order number _______
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method for units of MPN/100 mL, lab report uses units CFU/1
   based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) er
   discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location
Rio Grande North	08329928 - Rio Grande near Alameda
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Centra

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/15/16.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Repo

Stream Segment	Stream Name / Related USGS Gage	F
		High (>3,670 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--
		High

		(>3,360 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--
		High

1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sara
NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Wa

Table 4

Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between N

Monitoring Location	**E. coli Concentration (CFU/100 mL)**
Rio Grande North	41
Rio Grande South	246
Delta in E. coli Loading Between North and South Locations	

Notes:

1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a da

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x\ \text{Mean Daily Flow}\ \left(\frac{ft^3}{sec}\right) \text{x}\ 3{,}600\ \left(\frac{sec}{hr}\right) \text{x}\ 24\ \left(\frac{-}{d}\right.$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading n
MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximu
Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permitte
that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collectio
segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, rat
used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily
June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda t
contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determinat
considers each stream segment separately - so even though the north segment flows into the south segme
each segment independently.

$\frac{1612.72\ sq.mi.}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angost

$1\ - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA v
percentage of the CMC WLA value divided by the TMDL minus the MOS. This percentage represents an es
the E. coli contributors (point sources, MS4s, and natural background). This percentage allows a reasonab
attributable to the CMC MS4s. Since our discussion, we removed the MOS from our percentage calculatio

Using the above approach, the CMC then has an E. coli loading value to compare to the applicable WLA val

Table 5
Calculate E. coli Loading Per Stream Segment Reach:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23

Table 6
Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply % based on WLA compared to total T

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Mid
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Dry

Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared t
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC
Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discu

Table 7
Compare Storm Event E. coli Loading to WLA for CMC:

Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--

2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	2.97E+10

Notes:

1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, Ju

It is important to remember that the TMDL is a planning tool to be used to achieve water qualit
throughout the year in these systems the target load will vary based on the changing flow. Mar
stream water quality and meet water quality criteria should be a goal to be attained. Meeting t
difficult objective.

ations. These samples were taken during dry weather - no stormwater

Date & Time of Sample	Date & Time Sample Delivered to HEAL
7/6/2016*	7/6/2016*
7/6/2016*	7/6/2016*

*Don't have this data since this is a simple example

.00 mL, for this analysis assuming two units are equivalent
ıumeration methods and probable standards reporting revision" and

	Daily Mean Flow (cfs) 7/6/16		
	772		
al)	631		

ɔrt:

·low Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report			
Moist (922-3,670 cfs)	**Mid (647-922 cfs)**	**Dry (359-647 cfs)**	**Low (0-359 cfs)**
--	Storm Event Flow Condition	--	--
Moist	**Mid**	**Dry**	**Low**

(929-3,360 cfs)	(664-929 cfs)	(319-664 cfs)	(0-319 cfs)
--	--	Storm Event Flow Condition	--
Moist	**Mid**	**Dry**	**Low**

ah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17
tershed, June 30, 2010, Figures 4.3 and 4.4.

North and South Locations:

Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
772	7.74E+11
631	3.80E+12
	3.02E+12

* If loading is negative, the delta will default to zero.

aily basis by NMED and EPA.

$\left(\frac{hr}{day}\right)$ = E. coli Loading $\left(\frac{CFU}{day}\right)$

nust be reduced to only represent the estimated CMC

m Daily Load (TMDL) for the Middle Rio Grande
es, which no longer applies. NMED provided an e-mail

n of this sample, which is the division of the two stream
tios need to be applied to the E. coli loading. The areas
Load (TMDL) for the Middle Rio Grande Watershed,
o Angostura segment = 1,612.72 sq. mi. with the total
tion is not an additive determination - the WLA
ent, the WLA, and therefore the E. coli loading, looks at

ura

alues. This approach uses percentages that calculate a
timate of the percent of the CMC E. coli loading to all of
le estimation of the percent of the E. coli loading that is
n.

lues, for a given stream segment and flow regime.

E. coli Loading (CFU/day) for Each Segment
2.33E+12
6.95E+11

TMDL:

Percent of E. coli Associated with MS4s	Total MS4 E. coli Loading (CFU/day) for Each Segment
--	--
4.3%	2.97E+10

o total TMDL minus the MOS.
WLA compared to the TMDL minus the
ussed this approach with NMED on 2/16/17.

Flow Conditions	WLA for CMC if there was a storm event	WLA - Potential Exceedance or Acceptable
Mid	No Value	WLA Acceptable

Even though there was no sto
this date - the calculated E. co
river - for the MS4 portion - e

Dry	1.57E+10	WLA Potential Exceedance

ne 30, 2010, page 40:

ty standards. Since flows vary
nagement of the load to improve
the calculated TMDL may be a

CoCoRaHS data

Maximum Flow Used for this Analysis (cfs)
772
631

Table 9: Compare Storm Event E. coli Loading to Total TMDL and to Point Source WLA

Stream Segment	Stream Name / Related USGS Gage
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)
	Total E. coli Loading

Notes:

1. E. coli loading calculated in Table 4.
2. TMDL values from Table 4.11 and 4.12 in NMED 2010 TMDL Report.
3. Assumes zero discharge from MS4s.

Table 4.11. TMDLs for *E. coli*: Rio Grande (Isleta Pueblo bnd to Alamed

	FLOW CONDITIO		
	High	Moist	Mid-Range
TMDL	**5.27×10^{12}**	**1.65×10^{12}**	**9.03×10^{11}**
NM0022250	1.35×10^{11}	1.35×10^{11}	1.35×10^{11}
NM0027873	1.34×10^{7}	1.34×10^{7}	1.34×10^{7}
NMS000101	3.36×10^{11}	8.41×10^{10}	5.66×10^{10}
NMR040000	3.73×10^{10}	9.35×10^{9}	6.29×10^{9}
Total Waste Load Allocation	**5.08×10^{11}**	**2.28×10^{11}**	**1.98×10^{11}**
Load Allocation	**3.36×10^{12}**	**8.41×10^{11}**	**5.66×10^{11}**
Margin of Safety	**1.40×10^{12}**	**5.77×10^{11}**	**1.38×10^{11}**

Table 4.12. TMDLs for *E. coli*: Rio Grande (non-Pueblo Alameda Bridge Div)

	FLOW CONDITIO			
	High	Moist	Mid-Range	
TMDL	**5.54×10^{12}**	**1.61×10^{12}**	-	
NM0023485	1.43×10^{9}	1.43×10^{9}	-	1
NM0027987	9.80×10^{9}	9.80×10^{9}	-	9
NM0029602	1.51×10^{9}	1.51×10^{9}	-	1
NMS000101	5.25×10^{10}	1.52×10^{10}	-	5
NMR040000	2.62×10^{11}	7.59×10^{10}	-	2
Total Waste Load Allocation	**3.28×10^{11}**	**1.04×10^{11}**	-	4
Load Allocation	**4.93×10^{12}**	**1.43×10^{12}**	-	5
Margin of Safety	**2.77×10^{11}**	**8.06×10^{10}**	-	2

The extensive data collection and analyses necessary to determine background
the Middle Rio Grande watershed were beyond the resources available for
therefore assumed that a portion of the load allocation is made up of natural bacl

ormwater flow on
oli loading in the
exceeds the WLA.

exceeds the WEAP

E. coli Loading (CFU/day)[1]	Flow Conditions	TMDL minus MOS minus the MS4 WLAs - from Tables 4.11 and 4.12 in 2010 TMDL Report[3]	Loading Compared to Total TMDL minus MOS minus MS4 WLAs
2.33E+12	Mid	No Value	OK
6.95E+11	Dry	3.44E+11	Loading Exceeds TMDL
3.02E+12			

la Street Bridge)

NS	
Dry	Low
5.77×10^{11}	1.89×10^{11}
1.35×10^{11}	1.35×10^{11}
1.34×10^{7}	1.34×10^{7}
2.09×10^{10}	4.67×10^{9}
2.32×10^{9}	5.19×10^{8}
1.58×10^{11}	1.40×10^{11}
2.09×10^{11}	4.86×10^{10}
2.10×10^{11}	1.89×10^{9}

to Angostura

Isleta to Alameda - Allowed Load Allocations - Dry Conditions

Source	Permit Number
ABCWUA	NM0022250
Sandia Peak Ski Co.	NM0027863
CMC MS4s	12 members
Other MS4s	Kirtland & Sandia
Non-Point & Natural Background	Load Allocation
MOS	
Total	

check MS4 contribution using TMDL table 2.32E+10

MS4 WLA/(TMDL-MOS-

E. coli Loading (CFU/day) = 6.95E+11

Isleta to Alameda - This Sampling Event =- Proportion of E. cc

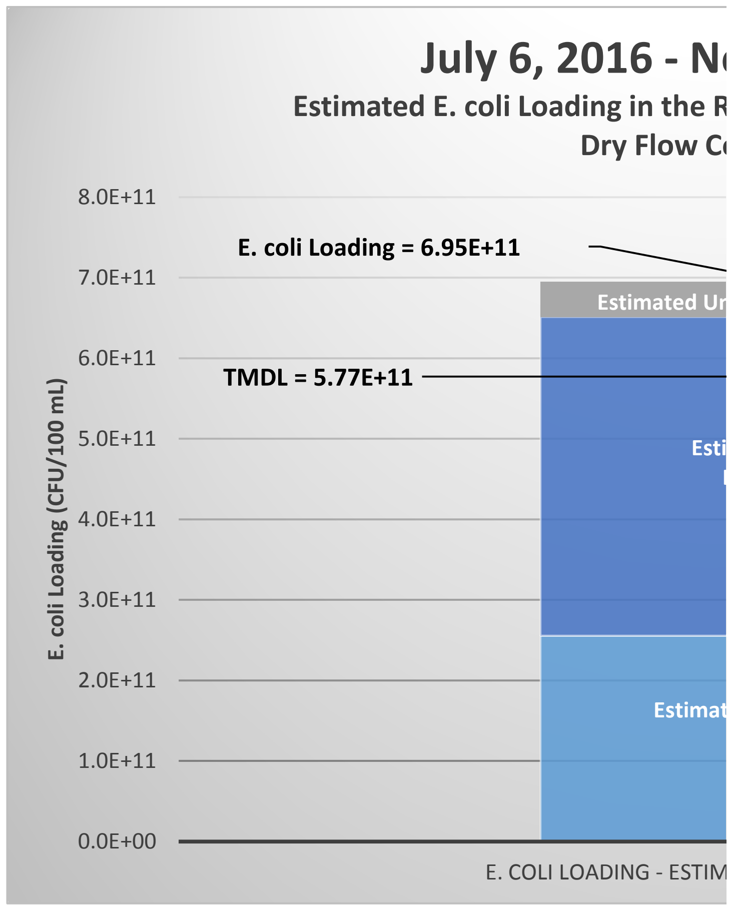
Source	Permit Number

NS	
Dry	Low
5.85×10^{11}	**2.96×10^{11}**
1.43×10^{9}	1.43×10^{9}
9.80×10^{9}	9.80×10^{9}
1.51×10^{9}	1.51×10^{9}
5.43×10^{9}	2.80×10^{9}
2.71×10^{10}	1.40×10^{10}
4.53×10^{10}	**2.95×10^{10}**
5.10×10^{11}	**2.63×10^{11}**
2.92×10^{10}	**2.96×10^{9}**

l *E. coli* loads for
this study. It is
kground loads.

ABCWUA	NM0022250
Sandia Peak Ski Co.	NM0027863
CMC MS4s	12 members
Other MS4s	Kirtland & Sandia
Non-Point & Natural Background	Load Allocation
MOS	
Unknown Sources	
Total E. coli Loading	

TMDL	5.77E+11
check MS4 contribution using TMDL table	6.29E+10



Point Source WLA - from Tables 4.11 and 4.12 in 2010 TMDL Report	Estimated Point Source Loading (23.4% of E. coli Loading) (CFU/day)[1]	Point Source Loading (23.4% of Loading) Compared to Point Source WLA
No Value	No Value	OK
1.35E+11	1.63E+11	Loading Exceeds WLA

;

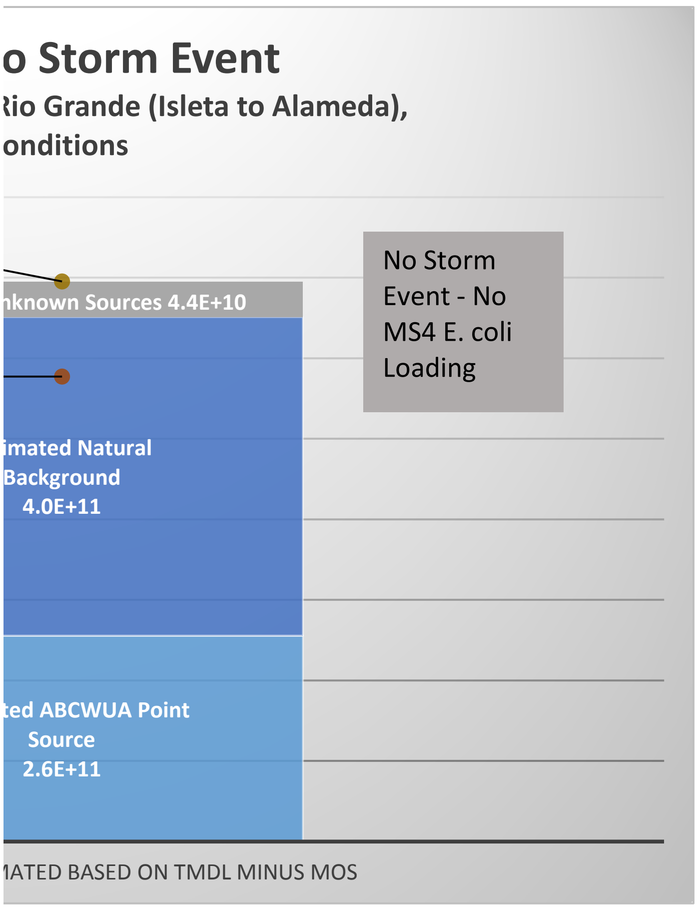
WLA	% of Total
1.35E+11	23.4%
1.34E+07	0%
1.57E+10	2.7%
7.59E+09	1.3%
2.09E+11	36.2%
2.10E+11	36.4%
5.77E+11	100%

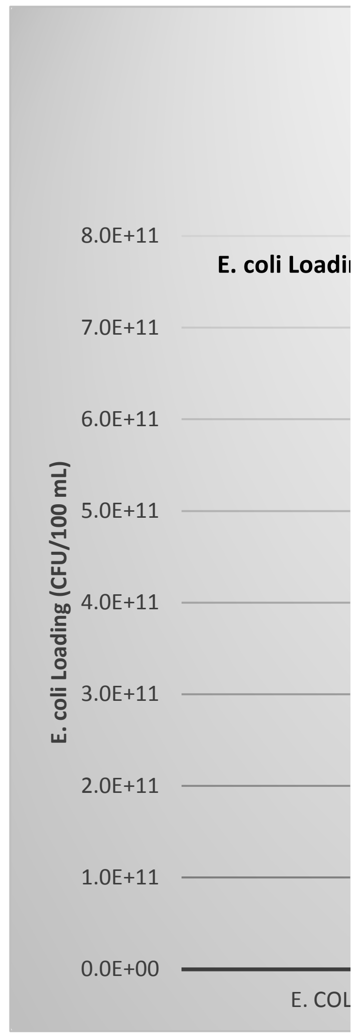
-Point Sources) = 10%

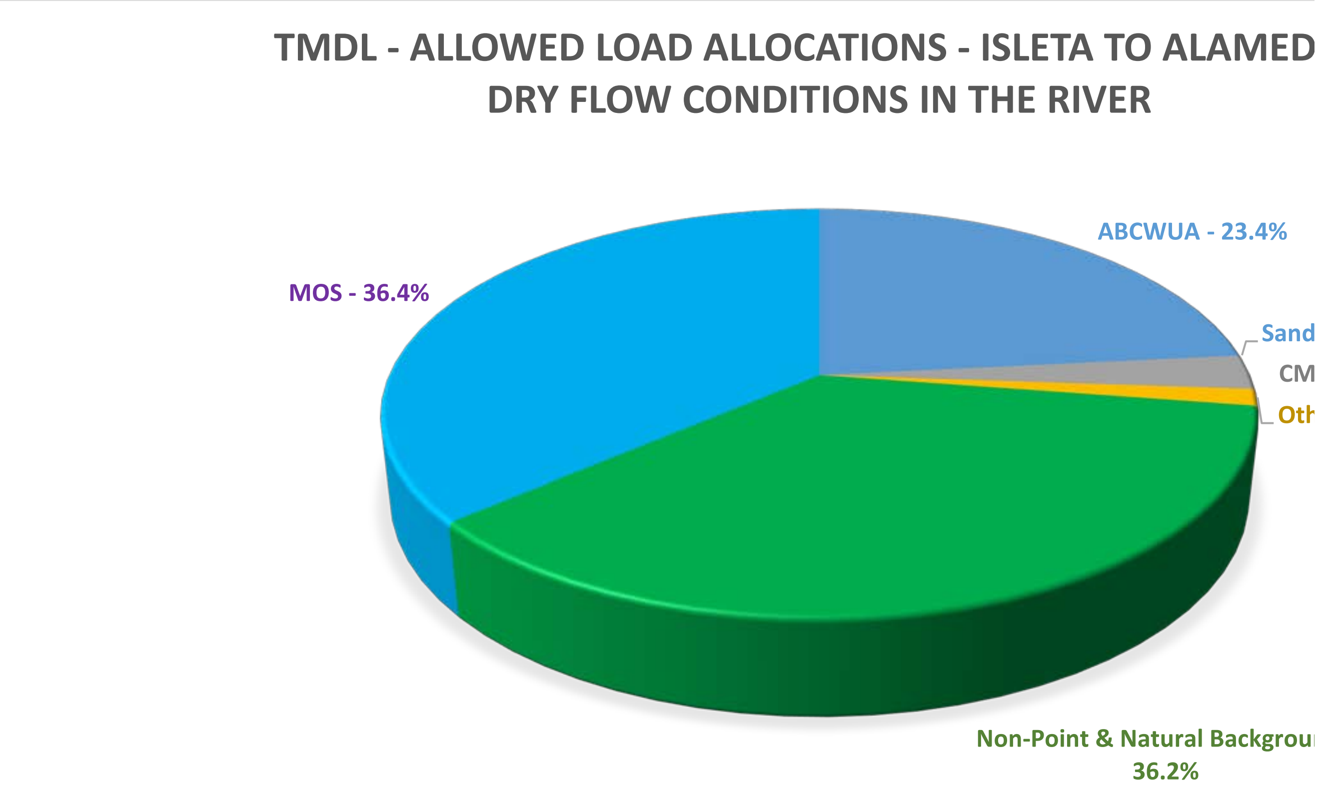
li Loading No Stormwater - 0% to MS4s

WLA & LA	% of Total TMDL	% of Total TMDL minus MOS	Estimated Based on TMDL minus MOS

1.35E+11	23.4%	36.8%	2.6E+11
1.34E+07	0.0%	0.0%	2.5E+07
1.57E+10	0.0%	4.3%	0.0E+00
7.59E+09	0.0%	2.1%	0.0E+00
2.09E+11	36.2%	56.9%	4.0E+11
2.10E+11	36.4%		
			4.4E+10
5.77E+11	96%	100%	6.95E+11
			5.77E+11

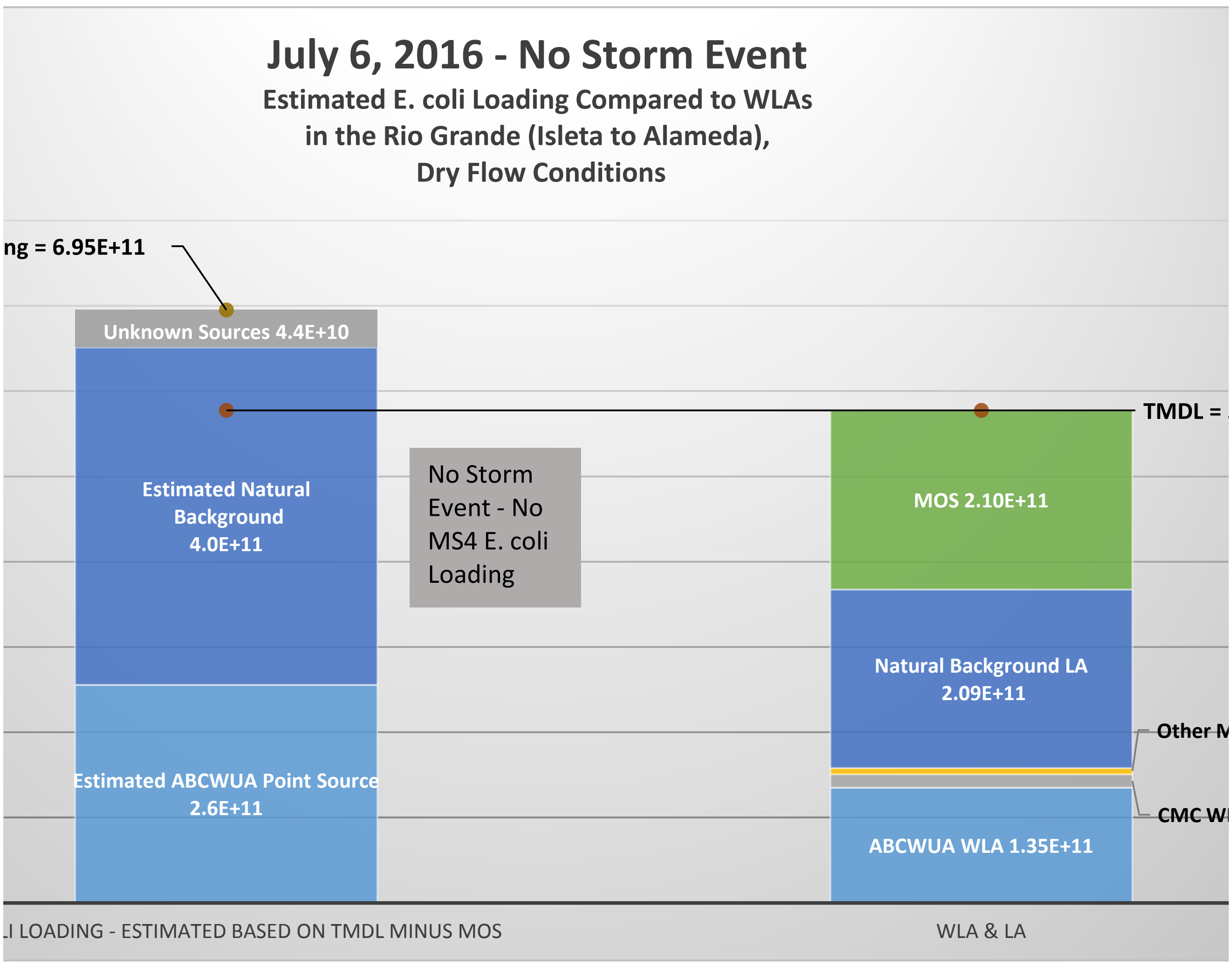






E. Coli Loading Exceeds WLA?

WLA Exceedance
WLA Exceedance
WLA OK
WLA OK
WLA Exceedance
WLA OK



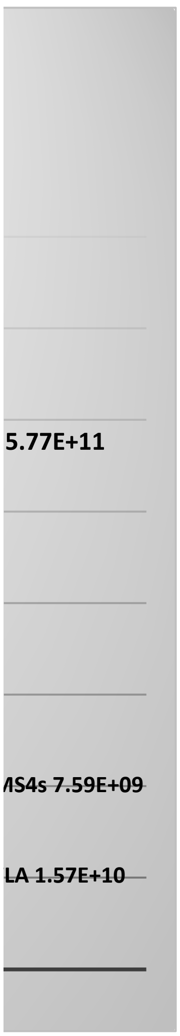
)A -

lia Peak Ski Co. - 0%

IC MS4s - 2.7%

ner MS4s - 1.3%

nd -


5.77E+11
MS4s 7.59E+09
LA 1.57E+10

Cooperative Monitoring Compliance (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Wet Season Wet Weather Sampling

Date: 2/6/17

Storm Event Date: 12/21/2016 & 12/22/16 - Data provided by AM

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 ml)[3]
Rio Grande North	3.1
Rio Grande South	317

Notes:
1. Hall Environmental Analysis Laboratory (HEAL) lab report for Rio Grande North: Order number 1612B89
2. HEAL lab report for Rio Grande South: Order number 1612C60
3. HEAL lab method: SM 9223B Fecal Indicator. Note - lab method for units of MPN/100 ml, lab report uses units CFU/1
based on Feb. 26, 2014 NMED Memo "Triennial Review - Most probable number (MPN)/colony forming units (CFU) e
discussions with NMED, Feb. 2017.

Table 2
Rio Grande Flow:

Monitoring Location	USGS Gage & Location
Rio Grande North	08329928 - Rio Grande near Alameda
Rio Grande South	0833000 - Rio Grande at Albuquerque, NM (Centra

Notes:
1. See 'USGS Daily Mean Discharge' worksheet for data obtained from USGS website on 12/15/16.

Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Repo

Stream Segment	Stream Name / Related USGS Gage	Flow C
		High (>3,670 cfs)
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--
		High

		(>3,360 cfs)
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	--
		High

1. Flow ranges for flow conditions are not listed in Appendix B of WSB MS4 Permit, the flow ranges are from NMED, Sara
NMED meeting, which are from the US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Wa

Table 4

Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between N

Monitoring Location	**E. coli Concentration (CFU/100 mL)**
Rio Grande North	3.1
Rio Grande South	317
Delta in E. coli Loading Between North and South Locations	

Notes:

1. Used maximum in Table 2 for the Daily Mean Flow in the loading calculation. E. coli loading instream looked at on a da

E. Coli Loading Calculation:

$$E.Coli\ Concentration\ \left(\frac{CFU}{100mL}\right) x\ 28{,}316.85\ \left(\frac{mL}{ft^3}\right) x\ \text{Mean Daily Flow}\ \left(\frac{ft^3}{sec}\right) \text{x } 3{,}600\ \left(\frac{sec}{hr}\right) \text{x } 24\ \left(\frac{h}{d}\right.$$

Not all E. coli sampled in the Rio Grande is attributable to MS4 activities. This storm event E. coli loading n MS4 E. coli loading so that a comparison can be made to the MS4 Waste Load Allocations (WLAs).

The NMED presented a Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximu Watershed, June 30, 2010. This approach in 2010 has the MS4s divided into Phase I and Phase II permitte that applies to the current CMC MS4 members and remaining MS4 members.

The CMC monitoring scheme dis not have an interim E. coli sample at the Alameda Bridge during collectio segments. Therefore, to determine the E. coli loading for the northern and southern stream segments, rat used in NMED's Jurisdictional Area Approach in Appendix F of the US EPA Approved, Total Maximum Daily June 30, 2010 were used to determine this ratio. The total contributing watershed area for the Alameda t contributing watershed area = 2084.15 sq. mi. From the 2/1/17 meeting with NMED, the WLA determina considers each stream segment separately - so even though the north segment flows into the south segme each segment independently.

$\frac{1612.72\ sq.mi.}{}$ = 0.77 or 77% for the north segment - Alameda to Angost

$\frac{\quad}{2084.15\ sq.mi.}$ = 0.77 or 77% for the north segment - Alameda to Angost

$1 - 0.77$ = 0.23 or 23% for the south segment - Isleta to Alameda

An estimation of the E. coli loading attributable to the CMC is needed to allow comparison with the WLA v percentage of the CMC WLA value divided by the TMDL minus the MOS. This percentage represents an es of the E. coli contributors (point sources, MS4s, and natural background). This percentage allows a reason that is attributable to the CMC MS4s. Since our discussion, we removed the MOS from our percentage cal

Using the above approach, the CMC then has an E. coli loading value to compare to the applicable WLA val

Table 5

Calculate E. coli Loading Per Stream Segment Reach:

Stream Segment	Stream Name / Related USGS Gage	Contributing Area Ratio for Each Segment
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	0.77
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	0.23

Table 6

Calculate CMC MS4 E. coli Loading Per Stream Segment Reach - apply % based on WLA compared to total T

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	Mid
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	Mid

Notes:

1. Refer to "WLAs From NMED" worksheet for WLA for estimated percent of E. coli associated with the CMC compared t
2. The CMC measured a total E. coli loading in the Rio Grande - this is all of the E. coli, regardless of source - so the CMC Margin of Safety was used as a way to estimate what percent of the total E. coli could be attributed to the CMC. Discu

Table 7

Compare Storm Event E. coli Loading to WLA for CMC:

Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment

2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	--
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	7.27E+10

Notes:

1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, Ju

It is important to remember that the TMDL is a planning tool to be used to achieve water qualit throughout the year in these systems the target load will vary based on the changing flow. Mar stream water quality and meet water quality criteria should be a goal to be attained. Meeting t difficult objective.

AFCA for example of sample results that were taken during dry weather - no stormwater

Date & Time of Sample	Date & Time Sample Delivered to HEAL
12/21/2016 2:45PM	12/21/2016 3:20PM
12/22/2016 2:20PM	12/22/2016 2:50PM

00 ml, for this analysis assuming two units are equivalent
ıumeration methods and probable standards reporting revision" and

	Daily Mean Flow (cfs) 12/21/16	Daily Mean Flow (cfs) 12/22/16	Calculated Mean Flow (cfs) from 12/21/16 to 12/22/16	Maximum Flow Used for this Analysis (cfs)
	800	858	829	858
al)	798	881	840	881

ɔrt:

Conditions (from WSB MS4 Permit Appendix B) & NMED 2010 TMDL Report			
Moist (922-3,670 cfs)	**Mid** (647-922 cfs)	**Dry** (359-647 cfs)	**Low** (0-359 cfs)
--	Storm Event Flow Condition	--	--
Moist	**Mid**	**Dry**	**Low**

(929-3,360 cfs)	(664-929 cfs)	(319-664 cfs)	(0-319 cfs)
--	Storm Event Flow Condition	--	--
Moist	**Mid**	**Dry**	**Low**

ah Holcomb, Nov. 2016 e-mail (see "WLAs From NMED" worksheet) and 2/1/17
tershed, June 30, 2010, Figures 4.3 and 4.4.

North and South Locations:

Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
858	6.51E+10
881	6.83E+12
	6.77E+12

* If loading is negative, the delta will default to zero.

aily basis by NMED and EPA.

$\frac{hr}{day}\Big)$ = E. coli Loading $\left(\frac{CFU}{day}\right)$

nust be reduced to only represent the estimated CMC

m Daily Load (TMDL) for the Middle Rio Grande
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lues, for a given stream segment and flow regime.

E. coli Loading (CFU/day) for Each Segment
5.21E+12
1.56E+12

TMDL:

Percent of E. coli Associated with MS4s	Total MS4 E. coli Loading (CFU/day) for Each Segment
--	--
4.7%	7.27E+10

:o total TMDL minus the MOS.
WLA compared to the TMDL minus the
ussed this approach with NMED on 2/16/17.

Flow Conditions	WLA for CMC if there was a storm event	WLA - Potential Exceedance or Acceptable

Mid	No Value	WLA Acceptable
Mid	4.22E+10	WLA Potential Exceedance

Even though there was no stormwater flow on this date - the calculated E. coli loading in the river - for the MS4 portion - exceeds the WLA.

ne 30, 2010, page 40:

ty standards. Since flows vary
nagement of the load to improve
the calculated TMDL may be a

CoCoRaHS data

Table 9: Compare Storm Event E. coli Loading to Total TMDL and to Point Source WLA

Stream Segment	Stream Name / Related USGS Gage
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)
	Total E. coli Loading

Notes:

2. TMDL values from Table 4.11 and 4.12 in NMED 2010 TMDL Report.
3. Assumes zero discharge from MS4s.

Table 4.11. TMDLs for *E. coli*: Rio Grande (Isleta Pueblo bnd to Alamed

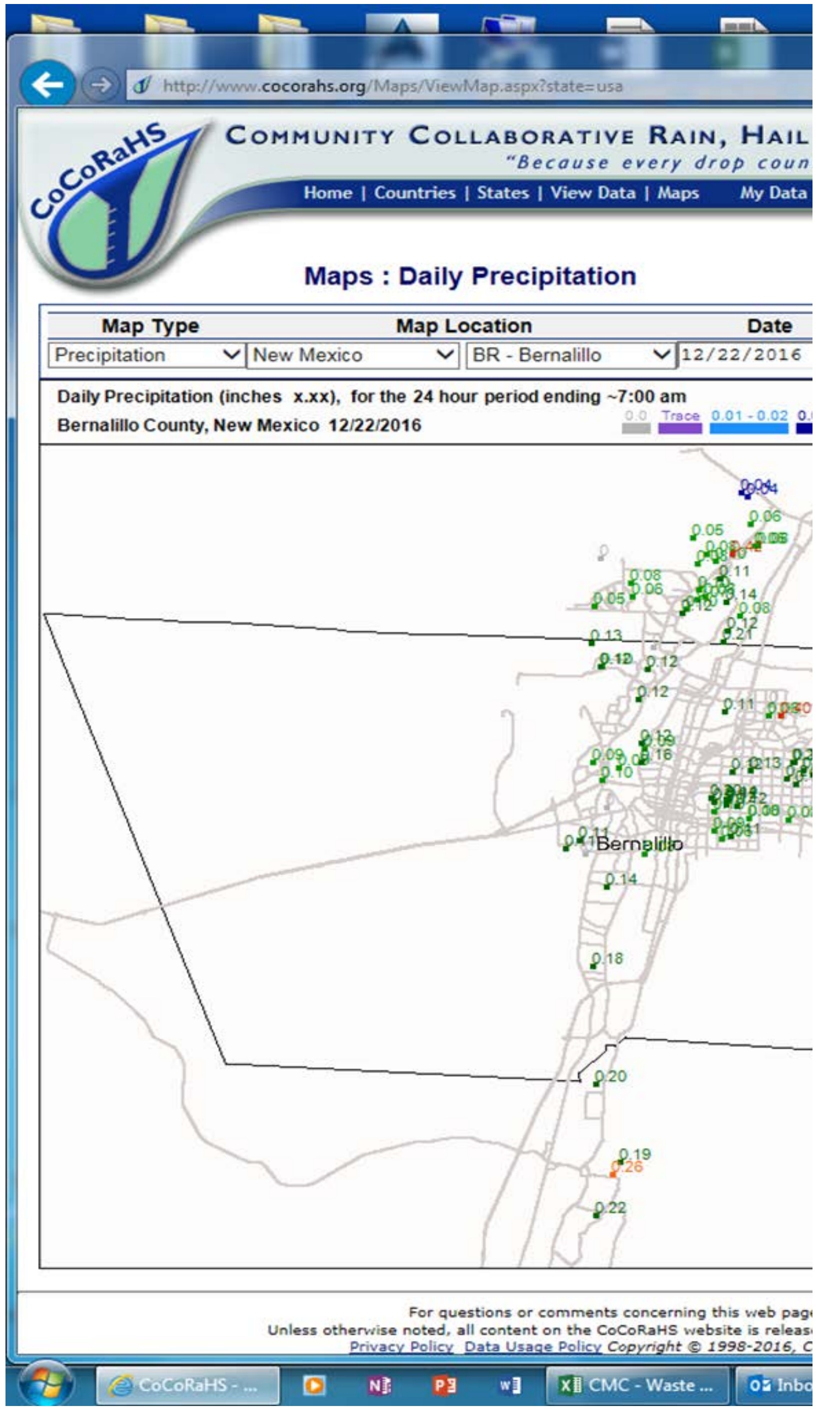
	FLOW CONDITIO		
	High	**Moist**	**Mid-Range**
TMDL	**5.27×10^{12}**	**1.65×10^{12}**	**9.03×10^{11}**
NM0022250	1.35×10^{11}	1.35×10^{11}	1.35×10^{11}
NM0027873	1.34×10^{7}	1.34×10^{7}	1.34×10^{7}
NMS000101	3.36×10^{11}	8.41×10^{10}	5.66×10^{10}
NMR040000	3.73×10^{10}	9.35×10^{9}	6.29×10^{9}
Total Waste Load Allocation	**5.08×10^{11}**	**2.28×10^{11}**	**1.98×10^{11}**
Load Allocation	**3.36×10^{12}**	**8.41×10^{11}**	**5.66×10^{11}**
Margin of Safety	**1.40×10^{12}**	**5.77×10^{11}**	**1.38×10^{11}**

Table 4.12. TMDLs for *E. coli*: Rio Grande (non-Pueblo Alameda Bridge

[illegible] Div)

	FLOW CONDITIO		
	High	Moist	Mid-Range
TMDL	**5.54×10^{12}**	**1.61×10^{12}**	-
NM0023485	1.43×10^{9}	1.43×10^{9}	-
NM0027987	9.80×10^{9}	9.80×10^{9}	-
NM0029602	1.51×10^{9}	1.51×10^{9}	-
NMS000101	5.25×10^{10}	1.52×10^{10}	-
NMR040000	2.62×10^{11}	7.59×10^{10}	-
Total Waste Load Allocation	**3.28×10^{11}**	**1.04×10^{11}**	-
Load Allocation	**4.93×10^{12}**	**1.43×10^{12}**	-
Margin of Safety	**2.77×10^{11}**	**8.06×10^{10}**	-

The extensive data collection and analyses necessary to determine background
the Middle Rio Grande watershed were beyond the resources available for
therefore assumed that a portion of the load allocation is made up of natural bac



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CoCoRaHS
Community Collaborative Rain, Hail
"Because every drop coun
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New Mexico
BR - Bernalillo
12/22/2016
Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
Bernalillo County, New Mexico 12/22/2016
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Bernalillo
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Privacy Policy Data Usage Policy Copyright © 1998-2016, C
CoCoRaHS - ...
CMC - Waste ...
Inbo

E. coli Loading (CFU/day)[1]	Flow Conditions	TMDL minus MOS minus MS4 WLA - from Tables 4.11 and 4.12 in 2010 TMDL Report[3]	Loading Compared to Total TMDL
5.21E+12	Mid	No Value	OK
1.56E+12	Mid	7.02E+11	Loading Exceeds TMDL
6.77E+12			

la Street Bridge)

NS	
Dry	Low
5.77 x 10^{11}	**1.89 x 10^{11}**
1.35 x 10^{11}	1.35 x 10^{11}
1.34 x 10^{7}	1.34 x 10^{7}
2.09 x 10^{10}	4.67 x 10^{9}
2.32 x 10^{9}	5.19 x 10^{8}
1.58 x 10^{11}	**1.40 x 10^{11}**
2.09 x 10^{11}	**4.86 x 10^{10}**
2.10 x 10^{11}	**1.89 x 10^{9}**

e to Angostura

Isleta to Alameda - Allowed Load Allocations - Mid Range Flo

Source	Permit Number
ABCWUA	NM0022250
Sandia Peak Ski Co.	NM0027863
CMC MS4s	12 members
Other MS4s	Kirtland & Sandia
Non-Point & Natural Background	Load Allocation
MOS	
Total	

check MS4 contribution using TMDL table 6.29E+10

E. coli Loading (CFU/day) = 1.56E+12

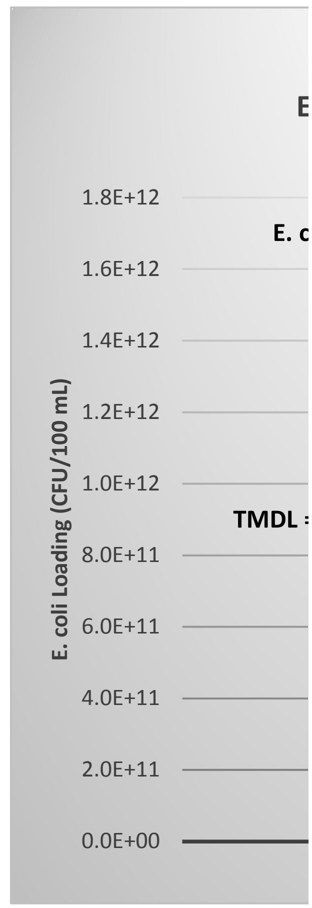
Isleta to Alameda - This Sampling Event =- Proportion of E. cc

ONS	
Dry	Low
5.85 x 10^11	**2.96 x 10^11**
1.43 x 10^9	1.43 x 10^9
9.80 x 10^9	9.80 x 10^9
1.51 x 10^9	1.51 x 10^9
5.43 x 10^9	2.80 x 10^9
2.71 x 10^10	1.40 x 10^10
4.53 x 10^10	**2.95 x 10^10**
5.10 x 10^11	**2.63 x 10^11**
2.92 x 10^10	**2.96 x 10^9**

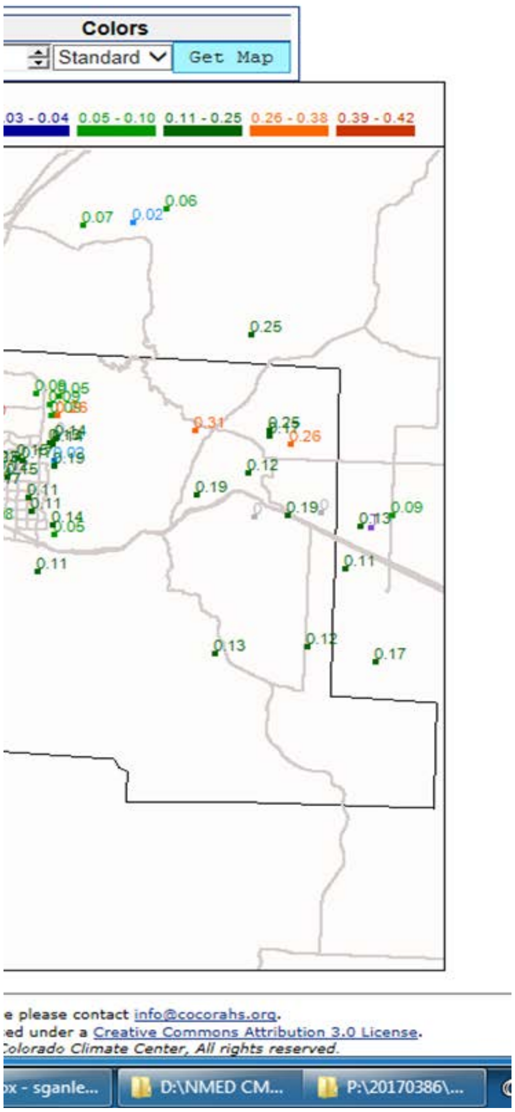
l *E. coli* loads for this study. It is kground loads.

Source	Permit Number
ABCWUA	NM0022250
Sandia Peak Ski Co.	NM0027863
CMC MS4s	12 members
Other MS4s	Kirtland & Sandia
Non-Point & Natural Background	Load Allocation
MOS	
Unknown Sources	
Total E. coli Loading	
TMDL	

check MS4 contribution using TMDL table 6.29E+10




CoCoRaHS - Community C...
& Snow Network
Select Language
Entry | Login


Colors
Standard
Get Map
.03 - 0.04
0.05 - 0.10
0.11 - 0.25
0.26 - 0.38
0.39 - 0.42
e please contact info@cocorahs.org.
ed under a Creative Commons Attribution 3.0 License.
Colorado Climate Center, All rights reserved.
D:\NMED CM...
P:\20170386\...

Loading Compared to Total TMDL minus MOS minus MS4 WLAs	Point Source WLA - from Tables 4.11 and 4.12 in 2010 TMDL Report	Estimated Point Source Loading (% of E. coli Loading) (CFU/day)	Point Source Loading (23.4% of Loading) Compared to Point Source WLA
No Value	No Value	No Value	OK
1.35E+11	0.00E+00	2.33E+11	Loading Exceeds WLA

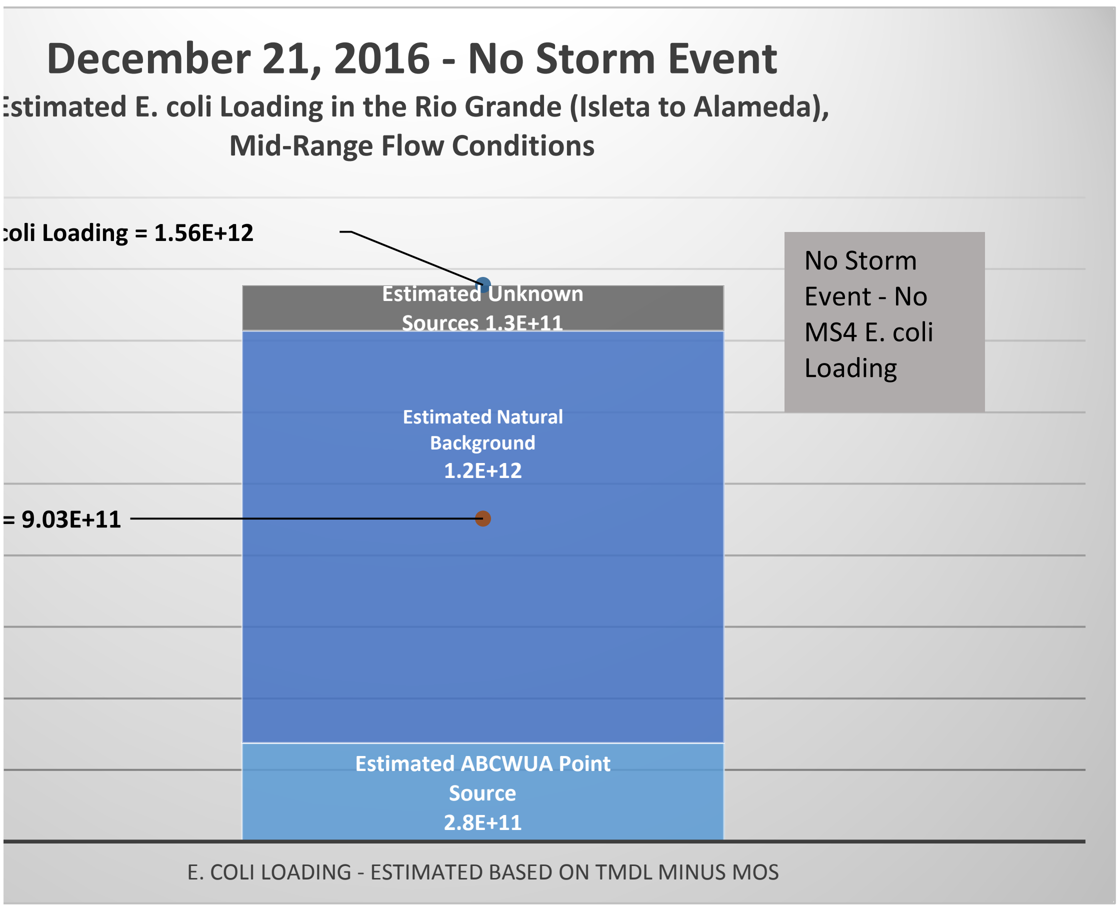
w Conditions

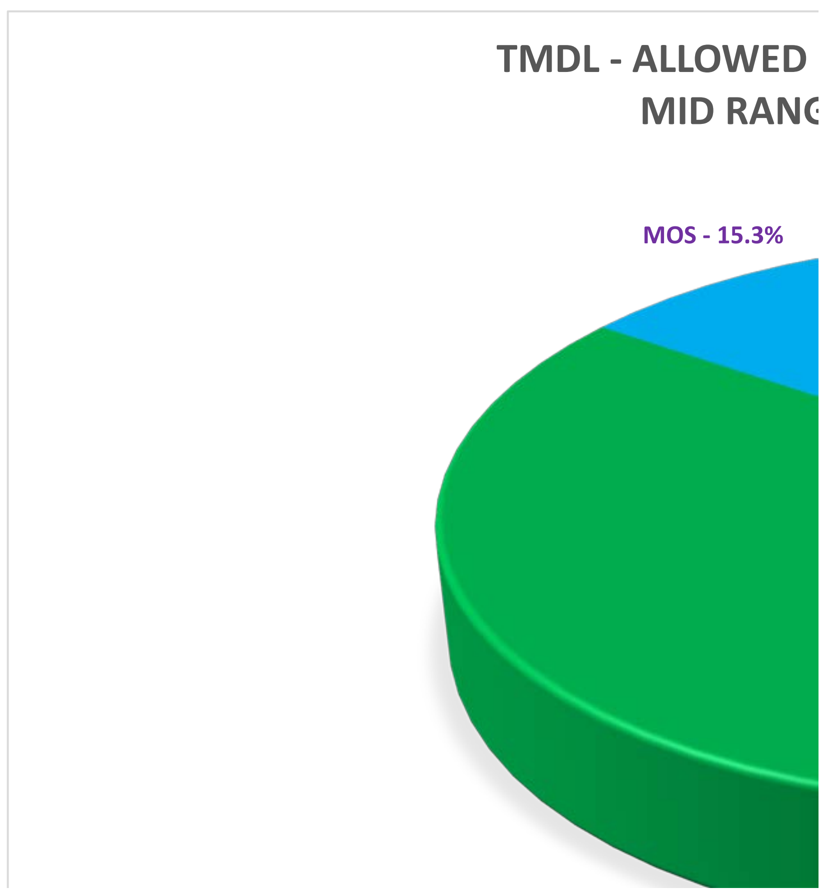
WLA	% of Total TMDL	% of Total WL
1.35E+11	15.0%	
1.34E+07	0.0%	
4.22E+10	4.7%	7%
2.07E+10	2.3%	3%
5.66E+11	62.7%	
1.38E+11	15.3%	
9.03E+11	100%	

›li Loading No Stormwater - 0% to MS4s

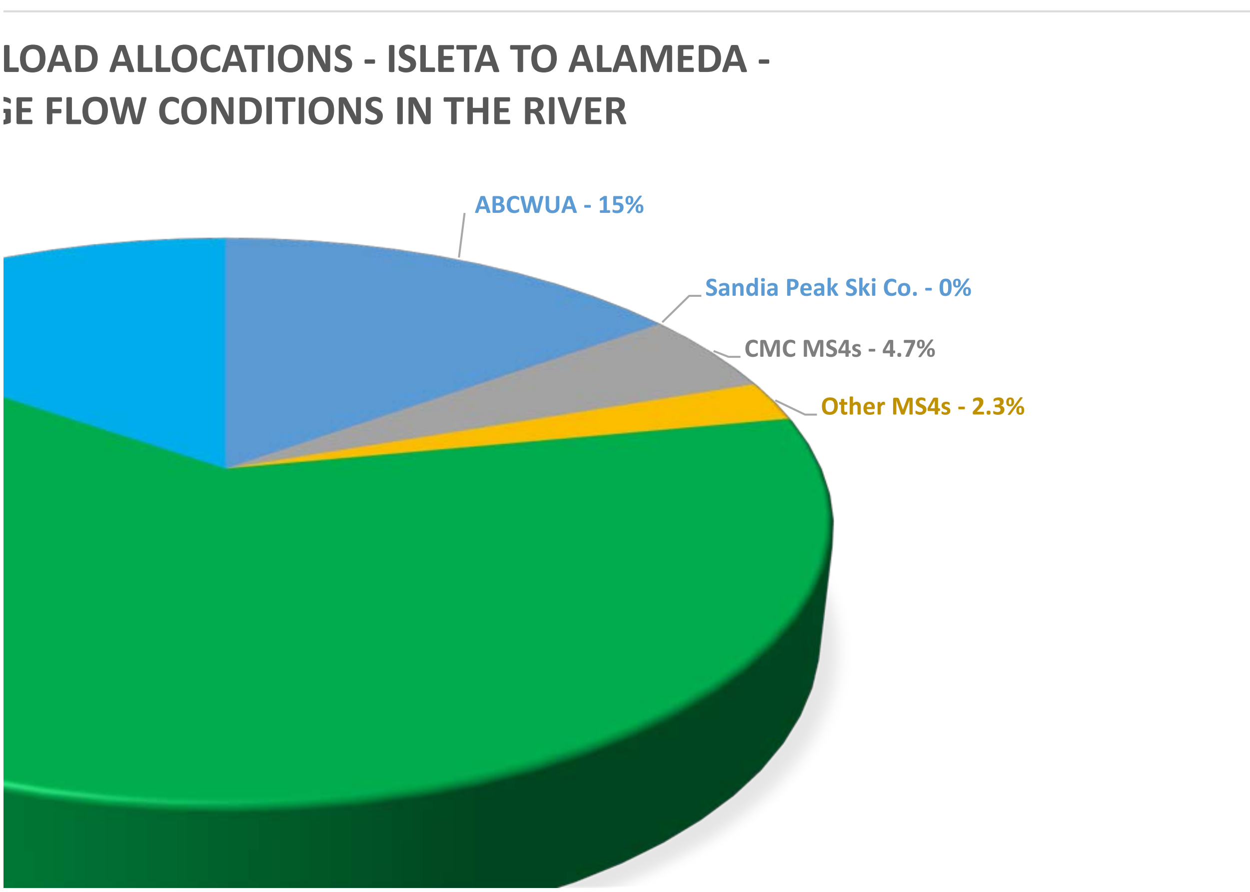
WLA	% of Total TMDL	% of Total TMDL minus MOS	E. Coli Loading - Estimated Based on TMDL minus MOS
1.35E+11	15.0%	17.7%	2.8E+11
1.34E+07	0.0%	0.0%	2.7E+07
4.22E+10	0.0%	5.5%	0.0E+00
2.07E+10	0.0%	2.7%	0.0E+00
5.66E+11	62.7%	74.1%	1.2E+12
1.38E+11	15.3%		
			1.3E+11
9.03E+11	93%	100%	1.56E+12
			9.03E+11

7% MS4s - but no storm event




TMDL - ALLOWED
MID RANG
MOS - 15.3%

E. Coli Loading Exceeds WLA?
WLA Exceedance
WLA Exceedance
WLA OK
WLA OK
WLA Exceedance
WLA OK



LOAD ALLOCATIONS - ISLETA TO ALAMEDA -
;E FLOW CONDITIONS IN THE RIVER
ABCWUA - 15%
Sandia Peak Ski Co. - 0%
CMC MS4s - 4.7%
Other MS4s - 2.3%

ound -

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

http://waterdata.usgs.gov/nwis/dv?cb_00060=on&cb_80154=on&cb_80155=on&format=html&site_no=0833000(
e=2015-12-14&end_date=2016-12-13

Downloaded on 1/11/17 - some values changed since 12/14/16 download. Values in WLA spreadsheets updated t(

Note: "P" designates USGS data is provisional and subject to revision

					Daily Mean Discharge, cubic feet per second				
DATE	**Dec 2015**	**Jan 2016**	**Feb 2016**	**Mar 2016**	**Apr 2016**	**May 2016**	**Jun 2016**	**Jul 2016**	**Aug 2016**
1		615[A]	528[P]	819[P]	795[P]	1,080[P]	2,650[P]	654[P]	740[P]
2		596[A]	526[P]	854[P]	798[P]	1,100[P] [e]	2,720[P]	692[P]	631[P]
3		621[A]	543[P]	819[P]	798[P]	1,100[P] [e]	2,670[P]	669[P]	643[P]
4		630[A]	591[P]	860[P]	800[P]	1,070[P]	2,780[P]	654[P]	623[P]
5		614[P]	564[P]	1,050[P]	647[P]	1,040[P]	2,850[P]	669[P]	891[P]
6		633[P]	584[P]	1,100[P]	590[P]	992[P]	3,220[P]	631[P]	717[P]
7		634[P]	569[P]	1,070[P]	557[P]	938[P]	3,510[P]	555[P]	691[P]
8		616[P]	582[P]	1,020[P]	534[P]	960[P]	3,350[P]	557[P]	752[P]
9		641[P]	577[P]	901[P]	654[P]	967[P]	3,260[P]	566[P]	666[P]
10		658[P]	540[P]	895[P]	586[P]	1,010[P]	3,280[P]	575[P]	669[P]
11		654[P]	562[P]	1,090[P]	562[P]	1,130[P]	3,130[P]	560[P]	525[P]
12		636[P]	575[P]	1,100[P]	754[P]	1,150[P]	2,960[P]	528[P]	415[P]
13		626[P] [e]	618[P]	1,120[P]	826[P]	1,170[P]	2,950[P]	574[P]	398[P]
14	1,820[A]	578[P]	646[P]	1,110[P]	661[P]	1,170[P]	2,790[P]	580[P]	482[P]
15	1,860[A]	539[P]	657[P]	978[P]	570[P]	1,270[P]	2,640[P]	608[P]	378[P]
16	1,870[A]	522[P]	671[P]	946[P]	594[P]	1,400[P]	2,620[P]	642[P]	373[P]
17	1,890[A]	521[P]	789[P]	912[P]	641[P]	1,510[P]	2,470[P]	655[P]	351[P]
18	1,750[A]	567[P]	881[P]	866[P]	654[P]	1,590[P]	2,220[P]	658[P]	395[P]
19	1,740[A]	619[P]	982[P]	815[P]	947[P]	1,690[P]	1,920[P]	656[P]	375[P]
20	1,770[A]	611[P]	998[P]	825[P]	962[P]	1,850[P]	1,690[P]	614[P]	360[P]
21	1,780[A]	614[P]	1,010[P]	817[P]	1,010[P]	1,970[P]	1,460[P]	561[P]	369[P]
22	1,700[A]	605[P]	895[P]	833[P]	1,070[P]	1,990[P]	1,220[P]	559[P]	761[P]
23	1,450[A]	605[P]	1,050[P]	827[P]	1,080[P]	1,990[P]	1,050[P]	536[P]	695[P]
24	1,280[A]	613[P]	1,080[P]	866[P]	1,060[P]	2,360[P]	860[P]	587[P]	547[P]
25	1,020[A]	614[P]	1,080[P]	907[P]	1,060[P]	2,580[P]	835[P]	600[P]	573[P]
26	970[A]	540[P]	1,100[P]	926[P]	1,180[P]	2,630[P]	905[P]	581[P]	542[P]
27	948[A]	526[P]	1,020[P]	922[P]	1,190[P]	2,610[P]	927[P]	543[P]	568[P]
28	927[A]	496[P]	977[P]	938[P]	1,190[P]	2,620[P]	919[P]	488[P]	526[P]
29	796[A]	515[P]	964[P]	924[P]	1,100[P]	2,670[P]	833[P]	532[P]	464[P]
30	687[A]	516[P]		872[P]	1,060[P]	2,700[P]	731[P]	745[P]	462[P]
31	650[A]	522[P]		840[P]		2,700[P]		1,080[P]	384[P]
COUNT	**18**	**31**	**29**	**31**	**30**	**31**	**30**	**31**	**31**
MAX	**1,890**	**658**	**1,100**	**1,120**	**1,190**	**2,700**	**3,510**	**1,080**	**891**

MIN	650	496	526	815	534	938	731	488	351

Downloaded on 12/14/16

					Daily Mean Discharge, cubic feet per second				
DATE	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016
1		615 A	528 P	819 P	795 P	1,080 P	2,650 P	654 P	731 P
2		596 A	526 P	854 P	798 P	1,100 P	2,720 P	692 P	615 P
3		621 A	543 P	819 P	798 P	1,080 P	2,670 P	669 P	627 P
4		630 A	591 P	860 P	800 P	1,070 P	2,780 P	654 P	607 P
5		614 P	564 P	1,050 P	647 P	1,040 P	2,850 P	669 P	885 P
6		633 P	584 P	1,100 P	590 P	992 P	3,220 P	631 P	716 P
7		634 P	569 P	1,070 P	557 P	938 P	3,510 P	555 P	703 P
8		616 P	582 P	1,020 P	534 P	960 P	3,350 P	557 P	778 P
9		641 P	577 P	901 P	654 P	967 P	3,250 P	566 P	701 P
10		658 P	540 P	895 P	586 P	1,010 P	3,260 P	575 P	720 P
11		654 P	562 P	1,090 P	562 P	1,130 P	3,110 P	560 P	569 P
12		636 P	575 P	1,100 P	754 P	1,150 P	2,930 P	528 P	444 P
13		610 P e	618 P	1,120 P	826 P	1,170 P	2,920 P	574 P	421 P
14	1,820 A	578 P	646 P	1,110 P	661 P	1,170 P	2,770 P	580 P	497 P
15	1,860 A	539 P	657 P	978 P	570 P	1,270 P	2,620 P	608 P	386 P
16	1,870 A	522 P	671 P	946 P	594 P	1,400 P	2,590 P	642 P	373 P
17	1,890 A	521 P	789 P	912 P	641 P	1,510 P	2,440 P	655 P	348 P
18	1,750 A	567 P	881 P	866 P	654 P	1,590 P	2,190 P	658 P	389 P
19	1,740 A	619 P	982 P	815 P	947 P	1,690 P	1,900 P	656 P	365 P
20	1,770 A	611 P	998 P	825 P	962 P	1,850 P	1,670 P	614 P	348 P
21	1,780 A	614 P	1,010 P	817 P	1,010 P	1,970 P	1,450 P	561 P	353 P
22	1,700 A	605 P	895 P	833 P	1,070 P	1,990 P	1,210 P	559 P	766 P
23	1,450 A	605 P	1,050 P	827 P	1,080 P	1,990 P	1,040 P	536 P	722 P
24	1,280 A	613 P	1,080 P	866 P	1,060 P	2,360 P	850 P	587 P	563 P
25	1,020 A	614 P	1,080 P	907 P	1,060 P	2,580 P	826 P	600 P	588 P
26	970 A	540 P	1,100 P	926 P	1,180 P	2,630 P	896 P	581 P	554 P
27	948 A	526 P	1,020 P	922 P	1,190 P	2,610 P	919 P	543 P	576 P
28	927 A	496 P	977 P	938 P	1,190 P	2,620 P	919 P	488 P	533 P
29	796 A	515 P	964 P	924 P	1,100 P	2,670 P	833 P	532 P	464 P
30	687 A	516 P		872 P	1,060 P	2,700 P	731 P	747 P	462 P
31	650 A	522 P		840 P		2,700 P		1,090 P	380 P
COUNT	18	31	29	31	30	31	30	31	31
MAX	1,890	658	1,100	1,120	1,190	2,700	3,510	1,090	885
MIN	650	496	526	815	534	938	731	488	348

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ɔ reflect 1/11/17 download.

Sep 2016	Oct 2016	Nov 2016	Dec 2016
347^{P}	264^{P}	251^{P}	816^{P}
319^{P}	223^{P}	283^{P}	845^{P}
312^{P}	222^{P}	276^{P}	712^{P}
343^{P}	179^{P}	285^{P}	638^{P}
331^{P}	146^{P}	314^{P}	609^{P}
388^{P}	130^{P}	502^{P}	619^{P}
503^{P}	126^{P}	349^{P}	619^{P}
404^{P}	142^{P}	358^{P}	673^{P}
392^{P}	186^{P}	366^{P}	702^{P}
378^{P}	149^{P}	347^{P}	751^{P}
390^{P}	143^{P}	371^{P}	770^{P}
496^{P}	134^{P}	376^{P}	776^{P}
375^{P}	119^{P}	374^{P}	810^{P}
345^{P}	110^{P}	374^{P}	
304^{P}	116^{P}	454^{P}	
310^{P}	117^{P}	488^{P}	
285^{P}	122^{P}	522^{P}	
265$^{P\ e}$	110^{P}	524^{P}	
252$^{P\ e}$	112^{P}	604^{P}	
251$^{P\ e}$	117^{P}	666^{P}	
251$^{P\ e}$	122^{P}	722^{P}	798^{P}
250$^{P\ e}$	134^{P}	881^{P}	881^{P}
254^{P}	141^{P}	786^{P}	
223^{P}	133^{P}	770^{P}	
237^{P}	127^{P}	768^{P}	
262^{P}	126$^{P\ e}$	765^{P}	
270^{P}	128^{P}	766^{P}	
266^{P}	146^{P}	771^{P}	
257^{P}	156^{P}	780^{P}	
269^{P}	158^{P}	786^{P}	
	188^{P}		
30	**31**	**30**	**13**
503	**264**	**881**	**845**

USGS 08329928 RIO GRANDE NR ALAMEDA,

http://nwis.waterdata.usgs.gov/nwis/dv?cb_(
14&end_date=2016-12-13

Downloaded on 1/11/17 - no difference from

Note: "P" designates USGS data is provisional

DATE	Dec 2015	Jan 2016	Feb 2016
1		611^{P}	506^{P}
2		603^{P}	498^{P}
3		622^{P}	590$^{P\ e}$
4		624^{P}	610$^{P\ e}$
5		619^{P}	548^{P}
6		649^{P}	564^{P}
7		649^{P}	592^{P}
8		648^{P}	610^{P}
9		679^{P}	633^{P}
10		666^{P}	626^{P}
11		655^{P}	615^{P}
12		647^{P}	604^{P}
13		614^{P}	649^{P}
14	1,770^{P}	533^{P}	662^{P}
15	1,750^{P}	515^{P}	644^{P}
16	1,690^{P}	512^{P}	652^{P}
17	1,740^{P}	532^{P}	775^{P}
18	1,510^{P}	621^{P}	870^{P}
19	1,560^{P}	663^{P}	1,040^{P}
20	1,650^{P}	662^{P}	1,040^{P}
21	1,620^{P}	655^{P}	1,030^{P}
22	1,440^{P}	671^{P}	834^{P}
23	1,200^{P}	666^{P}	1,190^{P}
24	1,070^{P}	656^{P}	1,190^{P}
25	849^{P}	642^{P}	1,190^{P}
26	825^{P}	554^{P}	1,200^{P}
27	793^{P}	539^{P}	1,020^{P}
28	797^{P}	544^{P}	999^{P}
29	720^{P}	554^{P}	989^{P}
30	653^{P}	546^{P}	
31	629^{P}	531^{P}	
COUNT	**18**	**31**	**29**
MAX	**1,770**	**679**	**1,200**

223	110	251	609

MIN	629	512	498

Sep 2016	Oct 2016	Nov 2016	Dec 2016
342 P	253 P	289 P	733 P
313 P	216 P	321 P	759 P
302 P	217 P	315 P	655 P
332 P	171 P	324 P	601 P
316 P	136 P	347 P	579 P
370 P	118 P	490 P	592 P
484 P	115 P	364 P	594 P
386 P	131 P	373 P	639 P
374 P	180 P	379 P	665 P
360 P	142 P	362 P	707 P
370 P	137 P	383 P	725 P
467 P	130 P	387 P	732 P
354 P	114 P	387 P	764 P
325 P	105 P	385 P	
289 P	116 P	450 P	
295 P	119 P	479 P	
271 P	127 P	505 P	
231 P e	115 P	506 P	
225 P e	119 P	569 P	
234 P e	128 P	617 P	
245 P e	131 P	663 P	
242 P e	142 P	805 P	
243 P	148 P	709 P	
215 P	134 P	698 P	
228 P	123 P	695 P	
250 P	121 P e	695 P	
256 P	122 P	695 P	
252 P	147 P	699 P	
246 P	160 P	705 P	
255 P	163 P	710 P	
	206 P		
30	31	30	13
484	253	805	764
215	105	289	579

Downloaded on 12/14/16

DATE	Dec 2015	Jan 2016	Feb 2016
1		611 P	506 P
2		603 P	498 P
3		622 P	590 P e
4		624 P	610 P e
5		619 P	548 P
6		649 P	564 P
7		649 P	592 P
8		648 P	610 P
9		679 P	633 P
10		666 P	626 P
11		655 P	615 P
12		647 P	604 P
13		614 P	649 P
14	1,770 P	533 P	662 P
15	1,750 P	515 P	644 P
16	1,690 P	512 P	652 P
17	1,740 P	532 P	775 P
18	1,510 P	621 P	870 P
19	1,560 P	663 P	1,040 P
20	1,650 P	662 P	1,040 P
21	1,620 P	655 P	1,030 P
22	1,440 P	671 P	834 P
23	1,200 P	666 P	1,190 P
24	1,070 P	656 P	1,190 P
25	849 P	642 P	1,190 P
26	825 P	554 P	1,200 P
27	793 P	539 P	1,020 P
28	797 P	544 P	999 P
29	720 P	554 P	989 P
30	653 P	546 P	
31	629 P	531 P	
COUNT	18	31	29
MAX	1,770	679	1,200
MIN	629	512	498

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12/14/16 download
and subject to revision

Daily Mean Discharge, cubic feet per second									
Mar 2016	**Apr 2016**	**May 2016**	**Jun 2016**	**Jul 2016**	**Aug 2016**	**Sep 2016**	**Oct 2016**	**Nov 2016**	**Dec 2016**
821 P	735 P	1,080 P	2,840 P	795 P	717 P	401 P	299 P	270 P	698 P
866 P	727 P	1,100 P	2,860 P	816 P	666 P	357 P	272 P	281 P	724 P
795 P	738 P	1,100 P	2,840 P	799 P	696 P	388 P	262 P	279 P	590 P
792 P	744 P	1,110 P	3,060 P	793 P	705 P	403 P	196 P	292 P	582 P
1,100 P	634 P	1,120 P	3,160 P	792 P	846 P	407 P	184 P	312 P	582 P
1,110 P	640 P	1,060 P	3,560 P	772 P	694 P	488 P	179 P	437 P	617 P
1,140 P	610 P	1,020 P	3,770 P	717 P	687 P	430 P	175 P	306 P	617 P
977 P	615 P	1,060 P	3,810 P	719 P	686 P	409 P	183 P	350 P	697 P
875 P	707 P	1,070 P	3,720 P	720 P	638 P	397 P	214 P	345 P	704 P
871 P	640 P	1,160 P	3,710 P	714 P	639 P	376 P	187 P	319 P	740 P
1,230 P	647 P	1,260 P	3,600 P	706 P	500 P	450 P	185 P	344 P	754 P
1,220 P	854 P	1,250 P	3,390 P	667 P	472 P	435 P	184 P	350 P	762 P
1,230 P	871 P	1,250 P	3,370 P	733 P	488 P	380 P	177 P	365 P	802 P
1,180 P	705 P	1,230 P	3,100 P	739 P	509 P	358 P	172 P	368 P	
868 P	640 P	1,300 P	2,920 P	768 P	468 P	334 P	170 P	419 P	
882 P	658 P	1,420 P	2,910 P	763 P	468 P	336 P	170 P	435 P	
878 P	636 P	1,490 P	2,620 P	743 P	465 P	324 P	170 P	465 P	
842 P	638 P	1,560 P	2,340 P	734 P	519 P	325 P	170 P	469 P	
774 P	945 P	1,710 P	1,960 P	730 P	466 P	325 P	171 P	548 P	
776 P	951 P	1,840 P	1,710 P	692 P	450 P	322 P	170 P	566 P	
787 P	1,070 P	2,000 P	1,460 P	672 P	453 P	327 P	176 P	639 P	800 P
781 P	1,130 P	1,990 P	1,210 P	652 P	695 P	350 P e	174 P	659 P	858 P
809 P	1,140 P	2,050 P	1,040 P	674 P	554 P	360 P e	175 P	643 P	
854 P	1,130 P	2,630 P	891 P	630 P	539 P	333 P	177 P	640 P	
993 P	1,140 P	2,880 P	883 P	655 P	546 P	339 P	167 P	664 P	
992 P	1,280 P	2,880 P	933 P	657 P	562 P	335 P	171 P	681 P	
1,020 P	1,280 P	2,790 P	940 P	606 P	530 P	321 P	177 P	709 P	
1,000 P	1,270 P	2,850 P	941 P	576 P	504 P	321 P	202 P	707 P	
974 P	1,150 P	2,940 P	892 P	600 P	442 P	315 P	210 P	690 P	
797 P	1,110 P	2,940 P	808 P	932 P	448 P	325 P	205 P	691 P	
782 P		2,900 P		881 P	399 P		209 P		
31	**30**	**31**	**30**	**31**	**31**	**30**	**31**	**30**	**13**
1,230	**1,280**	**2,940**	**3,810**	**932**	**846**	**488**	**299**	**709**	**802**

774	**610**	**1,020**	**808**	**576**	**399**	**315**	**167**	**270**	**582**

Daily Mean Discharge, cubic feet per second

Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
821[P]	735[P]	1,080[P]	2,840[P]	795[P]	717[P]	401[P]	299[P]	270[P]	698[P]
866[P]	727[P]	1,100[P]	2,860[P]	816[P]	666[P]	357[P]	272[P]	281[P]	724[P]
795[P]	738[P]	1,100[P]	2,840[P]	799[P]	696[P]	388[P]	262[P]	279[P]	590[P]
792[P]	744[P]	1,110[P]	3,060[P]	793[P]	705[P]	403[P]	196[P]	292[P]	582[P]
1,100[P]	634[P]	1,120[P]	3,160[P]	792[P]	846[P]	407[P]	184[P]	312[P]	582[P]
1,110[P]	640[P]	1,060[P]	3,560[P]	772[P]	694[P]	488[P]	179[P]	437[P]	617[P]
1,140[P]	610[P]	1,020[P]	3,770[P]	717[P]	687[P]	430[P]	175[P]	306[P]	617[P]
977[P]	615[P]	1,060[P]	3,810[P]	719[P]	686[P]	409[P]	183[P]	350[P]	697[P]
875[P]	707[P]	1,070[P]	3,720[P]	720[P]	638[P]	397[P]	214[P]	345[P]	704[P]
871[P]	640[P]	1,160[P]	3,710[P]	714[P]	639[P]	376[P]	187[P]	319[P]	740[P]
1,230[P]	647[P]	1,260[P]	3,600[P]	706[P]	500[P]	450[P]	185[P]	344[P]	754[P]
1,220[P]	854[P]	1,250[P]	3,390[P]	667[P]	472[P]	435[P]	184[P]	350[P]	762[P]
1,230[P]	871[P]	1,250[P]	3,370[P]	733[P]	488[P]	380[P]	177[P]	365[P]	802[P]
1,180[P]	705[P]	1,230[P]	3,100[P]	739[P]	509[P]	358[P]	172[P]	368[P]	
868[P]	640[P]	1,300[P]	2,920[P]	768[P]	468[P]	334[P]	170[P]	419[P]	
882[P]	658[P]	1,420[P]	2,910[P]	763[P]	468[P]	336[P]	170[P]	435[P]	
878[P]	636[P]	1,490[P]	2,620[P]	743[P]	465[P]	324[P]	170[P]	465[P]	
842[P]	638[P]	1,560[P]	2,340[P]	734[P]	519[P]	325[P]	170[P]	469[P]	
774[P]	945[P]	1,710[P]	1,960[P]	730[P]	466[P]	325[P]	171[P]	548[P]	
776[P]	951[P]	1,840[P]	1,710[P]	692[P]	450[P]	322[P]	170[P]	566[P]	
787[P]	1,070[P]	2,000[P]	1,460[P]	672[P]	453[P]	327[P]	176[P]	639[P]	
781[P]	1,130[P]	1,990[P]	1,210[P]	652[P]	695[P]	350[P] [e]	174[P]	659[P]	
809[P]	1,140[P]	2,050[P]	1,040[P]	674[P]	554[P]	360[P] [e]	175[P]	643[P]	
854[P]	1,130[P]	2,630[P]	891[P]	630[P]	539[P]	333[P]	177[P]	640[P]	
993[P]	1,140[P]	2,880[P]	883[P]	655[P]	546[P]	339[P]	167[P]	664[P]	
992[P]	1,280[P]	2,880[P]	933[P]	657[P]	562[P]	335[P]	171[P]	681[P]	
1,020[P]	1,280[P]	2,790[P]	940[P]	606[P]	530[P]	321[P]	177[P]	709[P]	
1,000[P]	1,270[P]	2,850[P]	941[P]	576[P]	504[P]	321[P]	202[P]	707[P]	
974[P]	1,150[P]	2,940[P]	892[P]	600[P]	442[P]	315[P]	210[P]	690[P]	
797[P]	1,110[P]	2,940[P]	808[P]	932[P]	448[P]	325[P]	205[P]	691[P]	
782[P]		2,900[P]		881[P]	399[P]		209[P]		

31	**30**	**31**	**30**	**31**	**31**	**30**	**31**	**30**	**13**
1,230	**1,280**	**2,940**	**3,810**	**932**	**846**	**488**	**299**	**709**	**802**
774	**610**	**1,020**	**808**	**576**	**399**	**315**	**167**	**270**	**582**

USGS 08331160 RIO GRANDE NEAR BOSQUE FARMS, NM

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01&end_date=2016-12-31

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Note: "P" designates USGS data is provisional and subject to revision

							Daily Mean Discharge, cubic feet
DATE	**Jan 2016**	**Feb 2016**	**Mar 2016**	**Apr 2016**	**May 2016**	**Jun 2016**	**Jul 2016**
1	646P	630P	818P	396P	---	2,550P	301P
2	628P	635P	760P	393P	---	2,710P	272P
3	631P	---	754P	420P	647P	2,570P	334P
4	634P	---	781P	446P	589P	2,620P	319P
5	639P	---	917P	---	554P	2,740P	294P
6	647P	---	1,060P	---	508P	2,870P	303P
7	697P	640P	990P	---	512P	3,190P	256P
8	668P	680P	927P	---	536P	3,180P	244P
9	670P	685P	763P	245P	497P	3,290P	209P
10	697P	687P	688P	224P	501P	3,390P	202P
11	687P	685P	821P	216P	595P	3,970P	194P
12	681P	680P	891P	233P	642P	3,840P	210P
13	691P	689P	868P	408P	659P	---	178P
14	644P	724P	871P	385P	633P	2,580P	142P
15	610P	720P	811P	309P	693P	2,320P	134P
16	605P	714P	730P	276P	806P	2,190P	133P
17	616P	751P	691P	305P	948P	2,000P	134P
18	622P	851P	603P	299P	1,050P	1,730P	155P
19	684P	949P	558P	390P	1,160P	1,510P	155P
20	662P	1,020P	545P	490P	1,280P	1,290P	135P
21	650P	1,040P	531P	494P	1,440P	1,080P	114P
22	659P	1,020P	515P	561P	1,540P	1,100P	116P
23	656P	1,020P	586P	582P	1,510P	875P	118P
24	674P	1,150P	589P	609P	1,760P	---	121P
25	686P	---	593P	618P	2,310P	---	125P
26	681P	1,100P	638P	655P	2,340P	---	119P
27	631P	1,100P	675P	706P	---	---	94P
28	629P	1,010P	621P	---	2,230P	475P	89P
29	629P	1,010P	566P	---	---	429P	84P
30	629P		522P	---	---	393P	170P
31	622P		440P		---		645P
COUNT	**31**	**24**	**31**	**23**	**25**	**25**	**31**
MAX	**697**	**1,150**	**1,060**	**706**	**2,340**	**3,970**	**645**

MIN	**605**	**630**	**440**	**216**	**497**	**393**	**84**

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per second				
Aug 2016	**Sep 2016**	**Oct 2016**	**Nov 2016**	**Dec 2016**
345 P	47 P	51 P	292 P	714 P
264 P	42 P	63 P	343 P	719 P
222 P	39 P	63 P	337 P	694 P
199 P	41 P	45 P	329 P	600 P
500 P	40 P	34 P	366 P	594 P
353 P	37 P	32 P	444 P	---
326 P	81 P	39 P	456 P	---
348 P	50 P	31 P	379 P	---
411 P	36 P	107 P	403 P	678 P
348 P	31 P	166 P	382 P	688 P
279 P	29 P	92 P	386 P	713 P
112 P	142 P	61 P	403 P	---
90 P	60 P	52 P	414 P	726 P
91 P	45 P	48 P	450 P	763 P
98 P	36 P	40 P	490 P	778 P
71 P	31 P	56 P	518 P	773 P
77 P	29 P	55 P	527 P	809 P
78 P	25 P	35 P	527 P	820 P
86 P	24 P	30 P	518 P	792 P
74 P	24 P	30 P	590 P	786 P
74 P	22 P	29 P	624 P	778 P
125 P	24 P	27 P	815 P	818 P
---	24 P	25 P	714 P	845 P
154 P	29 P	26 P	728 P	688 P
---	24 P	28 P	712 P	692 P
99 P	25 P	28 P	711 P	696 P
90 P	30 P	35 P	712 P	725 P
91 P	31 P	47 P	704 P	743 P
84 P	35 P	92 P	716 P	761 P
62 P	38 P	128 P	715 P	751 P
51 P		237 P		699 P
29	**30**	**31**	**30**	**27**
500	**142**	**237**	**815**	**845**

51	**22**	**25**	**292**	**594**

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

http://waterdata.usgs.gov/nwis/dv?cb_00060=on&cb_80154=on&cb_80155=on&format=html&site_no=08330000
e=2015-12-14&end_date=2016-12-13

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Note: "P" designates USGS data is provisional and subject to revision

	Daily Mean Discharge, cubic feet per second								
DATE	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017	Jul 2017	Aug 2017
1		746 A	463 A	763 A	3,410 A	3,810 A	3,730 A	668 A	581 A
2		709 A	474 A	687 A	3,480 A	3,570 A	3,530 A	620 A	464 A
3		690 A	442 A	665 A	3,430 A	3,300 A	3,410 A	601 A	455 A
4		641 A	537 A	694 A	3,290 A	3,080 A	3,350 A	582 A	481 A
5		614 A	579 A	730 A	3,280 A	2,830 A	3,330 A	604 A	513 A
6		608 A	591 A	707 A	3,150 A	2,820 A	3,260 A	581 A	496 A
7		596 A	598 A	688 A	2,700 A	2,870 A	3,240 A	583 A	467 A
8		585 A	587 A	685 A	2,450 A	2,910 A	3,230 A	565 A	422 A
9		586 A	620 A	769 A	2,430 A	3,590 A	3,380 A	570 A	392 A
10		579 A	628 A	806 A	2,390 A	4,610 A	3,430 A	581 A	376 A
11		575 A	692 A	814 A	2,460 A	4,560 A	3,480 A	522 A	466 A
12	776 A	605 A	711 A	822 A	2,550 A	4,950 A	3,260 A	488 A	701 A
13	810 A	609 A	779 A	802 A	2,600 A	4,990 A	3,040 A	461 A	518 A
14	803 A	635 A	897 A	971 A	2,620 A	4,970 A	2,800 A	590 A	420 A
15	791 A	862 A	882 A e	973 A	2,870 A	4,960 A	2,440 A	508 A	431 A
16	777 A	934 A	871 A e	1,260 A	3,200 A	4,860 A	2,020 A	533 A	395 A
17	816 A	855 A	879 A e	1,500 A	3,480 A	5,120 A	1,600 A	563 A	375 A
18	770 A	857 A	926 A e	1,740 A	3,560 A	5,190 A	1,240 A	607 A	371 A
19	780 A	838 A	943 A e	1,810 A	3,550 A	5,310 A	1,200 A	515 A	369 A
20	765 A	825 A	963 A e	1,880 A	3,600 A	5,350 A	1,140 A	479 A	376 A
21	771 A	822 A	961 A e	2,390 A	3,610 A	5,360 A	1,130 A	482 A	415 A
22	835 A	742 A	951 A	2,570 A	3,610 A	4,950 A	1,110 A	479 A	415 A
23	781 A	731 A	941 A	2,600 A	3,590 A	4,270 A	1,100 A	465 A	397 A
24	699 A	708 A	936 A	2,730 A	4,160 A	3,480 A	1,030 A	471 A	428 A
25	714 A	702 A	923 A	3,010 A	4,400 A	3,340 A	1,150 A	440 A	419 A
26	728 A	659 A e	925 A	3,180 A	4,430 A	3,330 A	924 A	436 A	389 A
27	729 A	626 A e	959 A	3,300 A	4,520 A	3,330 A	828 A	414 A	377 A
28	738 A	624 A e	890 A	3,610 A	4,160 A	3,330 A	753 A	470 A	358 A
29	781 A	564 A		3,620 A	4,000 A	3,370 A	685 A	467 A	371 A
30	737 A	541 A		3,590 A	4,000 A	3,360 A	666 A	407 A	439 A
31	719 A	497 A		3,520 A		3,650 A		745 A	369 A
COUNT	**20**	**31**	**28**	**31**	**30**	**31**	**30**	**31**	**31**
MAX	**835**	**934**	**963**	**3,620**	**4,520**	**5,360**	**3,730**	**745**	**701**

MIN	**699**	**497**	**442**	**665**	**2,390**	**2,820**	**666**	**407**	**358**

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Sep 2017	Oct 2017	Nov 2017	Dec 2017
363[A]	2,500[A]	634[P]	1,500[P]
337[A]	1,410[A]	670[P]	1,460[P]
324[A]	1,010[A]	680[P]	1,450[P]
310[A]	942[A]	688[P]	1,450[P]
304[A]	2,730[A]	694[P]	1,430[P]
370[A]	3,130[A]	677[P]	1,430[P]
394[A]	1,960[A]	799[P]	1,430[P]
426[A]	1,650[A]	882[P]	1,350[P]
447[A]	1,560[A]	898[P]	---
440[A]	1,480[A]	974[P]	1,260[P]
460[A]	1,220[P]	987[P]	1,270[P]
469[A]	1,130[P]	976[P]	
448[A]	1,080[P]	980[P]	
436[A]	796[P]	793[P]	
461[A]	739[P]	1,190[P]	
439[A]	730[P]	1,300[P]	
428[A]	684[P]	1,110[P]	
437[A]	650[P]	1,060[P]	
420[A]	603[P]	1,230[P]	
417[A]	582[P]	1,200[P]	
403[A]	576[P]	1,130[P]	
387[A]	580[P]	1,250[P]	
399[A]	578[P]	1,330[P]	
453[A]	557[P]	1,340[P]	
471[A]	520[P]	1,350[P]	
519[A]	534[P]	1,360[P]	
643[A]	523[P]	1,370[P]	
1,190[A]	533[P]	1,380[P]	
1,390[A]	528[P]	1,400[P]	
1,320[A]	625[P]	1,490[P]	
	651[P]		
30	**31**	**30**	**10**
1,390	**3,130**	**1,490**	**1,500**

USGS 08329928 RIO GRANDE NR ALAMEDA,

http://nwis.waterdata.usgs.gov/nwis/dv?cb_0
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Note: "P" designates USGS data is provisional

DATE	Dec 2016	Jan 2017	Feb 2017
1		736[P]	510[P]
2		733[P]	515[P]
3		721[P]	522[P]
4		669[P]	581[P]
5		657[P]	578[P]
6		640[P]	575[P]
7		641[P]	574[P]
8		639[P]	564[P]
9		635[P]	592[P]
10		613[P]	614[P]
11		627[P]	702[P]
12	748[P]	656[P]	707[P]
13	790[P]	651[P]	808[P]
14	806[P]	700[P]	897[P]
15	806[P]	868[P]	908[P]
16	823[P]	886[P]	909[P]
17	843[P]	841[P]	953[P]
18	814[P]	857[P]	1,010[P]
19	826[P]	858[P]	989[P]
20	823[P]	863[P]	972[P]
21	831[P]	835[P]	958[P]
22	894[P]	774[P]	956[P]
23	778[P]	752[P] e	952[P]
24	762[P]	730[P] e	955[P]
25	757[P]	708[P] e	981[P]
26	738[P]	686[P] e	983[P]
27	741[P]	664[P] e	965[P]
28	741[P]	642[P]	890[P]
29	796[P]	608[P]	
30	732[P]	574[P]	
31	737[P]	520[P]	
COUNT	**20**	**31**	**28**
MAX	**894**	**886**	**1,010**

304	520	634	1,260

MIN	732	520	510

NM

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and subject to revision

Daily Mean Discharge, cubic feet per second									
Mar 2017	Apr 2017	May 2017	Jun 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017
785[P]	3,580[P]	3,870[P]	3,740[P]	712[P]	470[P]	382[P]	2,510[P]	625[P]	1,430[P]
737[P]	3,580[P]	3,690[P]	3,600[P]	681[P]	455[P]	365[P]	1,200[P]	681[P]	1,390[P]
666[P]	3,620[P]	3,460[P]	3,430[P]	671[P]	469[P]	353[P]	972[P]	696[P]	1,380[P]
679[P]	3,430[P]	3,330[P]	3,430[P]	668[P]	459[P]	353[P]	992[P]	691[P]	1,360[P]
670[P]	3,360[P]	3,070[P]	3,390[P]	668[P]	502[P]	367[P]	3,390[P e]	707[P]	1,330[P]
684[P]	3,220[P]	3,090[P]	3,390[P]	648[P]	456[P]	426[P]	2,900[P e]	734[P]	1,310[P]
680[P]	2,830[P]	3,130[P]	3,370[P]	643[P]	438[P]	441[P]	1,780[P]	894[P]	1,310[P]
686[P]	2,630[P]	3,210[P]	3,330[P]	631[P]	435[P]	487[P]	1,460[P]	978[P]	1,220[P]
787[P]	2,580[P]	4,140[P e]	3,470[P]	635[P]	423[P]	503[P]	1,400[P]	965[P]	1,150[P]
826[P]	2,570[P]	---	3,460[P]	629[P]	409[P]	516[P]	1,380[P]	1,020[P]	1,150[P]
854[P]	2,660[P]	4,740[P e]	3,460[P]	595[P]	536[P]	540[P]	1,150[P]	1,010[P]	1,150[P]
883[P]	2,730[P]	4,880[P]	3,150[P]	582[P]	605[P]	558[P]	1,100[P]	1,010[P]	
917[P]	2,750[P]	4,930[P]	2,910[P]	548[P]	465[P]	562[P]	1,070[P]	990[P]	
1,100[P]	2,790[P]	4,980[P]	2,800[P]	643[P]	435[P]	559[P]	853[P e]	914[P]	
1,150[P]	3,080[P]	4,970[P]	2,480[P]	559[P]	444[P]	559[P]	825[P e]	1,210[P]	
1,420[P]	3,440[P]	4,970[P]	1,970[P]	562[P]	431[P]	524[P]	815[P e]	1,220[P]	
1,830[P]	3,660[P]	5,230[P]	1,520[P]	608[P]	423[P]	---	765[P e]	1,160[P]	
2,040[P]	3,700[P]	5,200[P]	1,230[P]	601[P]	423[P]	---	755[P e]	1,150[P]	
2,090[P]	3,730[P]	5,340[P]	1,210[P]	538[P]	422[P]	498[P]	720[P e]	1,210[P]	
2,180[P]	3,790[P]	5,360[P]	1,170[P]	532[P]	414[P]	500[P]	703[P]	1,160[P]	
2,650[P]	3,800[P]	5,340[P]	1,140[P]	532[P]	413[P]	473[P]	676[P]	1,160[P]	
2,790[P]	3,800[P]	4,860[P]	1,140[P]	532[P]	417[P]	473[P]	677[P]	1,230[P]	
2,930[P e]	3,800[P e]	4,290[P]	1,100[P]	517[P]	420[P]	484[P]	683[P]	1,270[P]	
3,090[P e]	---	3,710[P]	1,050[P]	522[P]	427[P]	507[P]	669[P]	1,270[P]	
3,260[P]	4,420[P e]	3,660[P]	1,120[P]	499[P]	435[P]	521[P]	655[P]	1,280[P]	
3,400[P]	4,390[P]	3,550[P]	939[P]	493[P]	417[P]	524[P]	652[P]	1,280[P]	
3,380[P]	4,390[P]	3,490[P]	854[P e]	465[P]	413[P]	744[P]	635[P]	1,290[P]	
3,510[P]	4,170[P]	3,450[P]	765[P e]	545[P]	415[P]	979[P]	631[P]	1,270[P]	
3,450[P]	4,130[P]	3,440[P]	718[P e]	491[P]	464[P]	1,330[P]	625[P]	1,280[P]	
3,590[P]	4,080[P]	3,420[P]	715[P]	487[P]	416[P]	1,270[P]	710[P]	1,380[P]	
3,590[P]		3,740[P]		766[P]	393[P]		666[P]		
31	**29**	**30**	**30**	**31**	**31**	**28**	**31**	**30**	**11**
3,590	**4,420**	**5,360**	**3,740**	**766**	**605**	**1,330**	**3,390**	**1,380**	**1,430**

666	**2,570**	**3,070**	**715**	**465**	**393**	**353**	**625**	**625**	**1,150**

USGS 08331160 RIO GRANDE NEAR BOSQUE FARMS, NM

https://waterdata.usgs.gov/nm/nwis/dv?cb_00060=on&format=html&site_no=08331160&
01&end_date=2016-12-31

Downloaded on 1/25/17

Note: "P" designates USGS data is provisional and subject to revision

							Daily Mean Discharge, cubic feet
DATE	**Jan 2016**	**Feb 2016**	**Mar 2016**	**Apr 2016**	**May 2016**	**Jun 2016**	**Jul 2016**
1	646P	630P	818P	396P	---	2,550P	301P
2	628P	635P	760P	393P	---	2,710P	272P
3	631P	---	754P	420P	647P	2,570P	334P
4	634P	---	781P	446P	589P	2,620P	319P
5	639P	---	917P	---	554P	2,740P	294P
6	647P	---	1,060P	---	508P	2,870P	303P
7	697P	640P	990P	---	512P	3,190P	256P
8	668P	680P	927P	---	536P	3,180P	244P
9	670P	685P	763P	245P	497P	3,290P	209P
10	697P	687P	688P	224P	501P	3,390P	202P
11	687P	685P	821P	216P	595P	3,970P	194P
12	681P	680P	891P	233P	642P	3,840P	210P
13	691P	689P	868P	408P	659P	---	178P
14	644P	724P	871P	385P	633P	2,580P	142P
15	610P	720P	811P	309P	693P	2,320P	134P
16	605P	714P	730P	276P	806P	2,190P	133P
17	616P	751P	691P	305P	948P	2,000P	134P
18	622P	851P	603P	299P	1,050P	1,730P	155P
19	684P	949P	558P	390P	1,160P	1,510P	155P
20	662P	1,020P	545P	490P	1,280P	1,290P	135P
21	650P	1,040P	531P	494P	1,440P	1,080P	114P
22	659P	1,020P	515P	561P	1,540P	1,100P	116P
23	656P	1,020P	586P	582P	1,510P	875P	118P
24	674P	1,150P	589P	609P	1,760P	---	121P
25	686P	---	593P	618P	2,310P	---	125P
26	681P	1,100P	638P	655P	2,340P	---	119P
27	631P	1,100P	675P	706P	---	---	94P
28	629P	1,010P	621P	---	2,230P	475P	89P
29	629P	1,010P	566P	---	---	429P	84P
30	629P		522P	---	---	393P	170P
31	622P		440P		---		645P
COUNT	**31**	**24**	**31**	**23**	**25**	**25**	**31**
MAX	**697**	**1,150**	**1,060**	**706**	**2,340**	**3,970**	**645**

MIN	605	630	440	216	497	393	84

referred_module=sw&period=&begin_date=2016-01-

per second				
Aug 2016	**Sep 2016**	**Oct 2016**	**Nov 2016**	**Dec 2016**
345[P]	47[P]	51[P]	292[P]	714[P]
264[P]	42[P]	63[P]	343[P]	719[P]
222[P]	39[P]	63[P]	337[P]	694[P]
199[P]	41[P]	45[P]	329[P]	600[P]
500[P]	40[P]	34[P]	366[P]	594[P]
353[P]	37[P]	32[P]	444[P]	---
326[P]	81[P]	39[P]	456[P]	---
348[P]	50[P]	31[P]	379[P]	---
411[P]	36[P]	107[P]	403[P]	678[P]
348[P]	31[P]	166[P]	382[P]	688[P]
279[P]	29[P]	92[P]	386[P]	713[P]
112[P]	142[P]	61[P]	403[P]	---
90[P]	60[P]	52[P]	414[P]	726[P]
91[P]	45[P]	48[P]	450[P]	763[P]
98[P]	36[P]	40[P]	490[P]	778[P]
71[P]	31[P]	56[P]	518[P]	773[P]
77[P]	29[P]	55[P]	527[P]	809[P]
78[P]	25[P]	35[P]	527[P]	820[P]
86[P]	24[P]	30[P]	518[P]	792[P]
74[P]	24[P]	30[P]	590[P]	786[P]
74[P]	22[P]	29[P]	624[P]	778[P]
125[P]	24[P]	27[P]	815[P]	818[P]
---	24[P]	25[P]	714[P]	845[P]
154[P]	29[P]	26[P]	728[P]	688[P]
---	24[P]	28[P]	712[P]	692[P]
99[P]	25[P]	28[P]	711[P]	696[P]
90[P]	30[P]	35[P]	712[P]	725[P]
91[P]	31[P]	47[P]	704[P]	743[P]
84[P]	35[P]	92[P]	716[P]	761[P]
62[P]	38[P]	128[P]	715[P]	751[P]
51[P]		237[P]		699[P]
29	**30**	**31**	**30**	**27**
500	**142**	**237**	**815**	**845**

51	**22**	**25**	**292**	**594**

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)
http://nwis.waterdata.usgs.gov/usa/nwis/uv/?cb_00060=on&cb_00065=on&format=rdb&site_no=08330000
Downloaded on 12/14/16
Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
08/10/2016 00:00 MDT	707
08/10/2016 00:15 MDT	699
08/10/2016 00:30 MDT	699
08/10/2016 00:45 MDT	690
08/10/2016 01:00 MDT	690
08/10/2016 01:15 MDT	690
08/10/2016 01:30 MDT	690
08/10/2016 01:45 MDT	681
08/10/2016 02:00 MDT	681
08/10/2016 02:15 MDT	690
08/10/2016 02:30 MDT	681
08/10/2016 02:45 MDT	681
08/10/2016 03:00 MDT	681
08/10/2016 03:15 MDT	690
08/10/2016 03:30 MDT	690
08/10/2016 03:45 MDT	699
08/10/2016 04:00 MDT	699
08/10/2016 04:15 MDT	699
08/10/2016 04:30 MDT	699
08/10/2016 04:45 MDT	699
08/10/2016 05:00 MDT	707
08/10/2016 05:15 MDT	707
08/10/2016 05:30 MDT	707
08/10/2016 05:45 MDT	699
08/10/2016 06:00 MDT	699
08/10/2016 06:15 MDT	699
08/10/2016 06:30 MDT	690
08/10/2016 06:45 MDT	690
08/10/2016 07:00 MDT	681
08/10/2016 07:15 MDT	681
08/10/2016 07:30 MDT	690
08/10/2016 07:45 MDT	681
08/10/2016 08:00 MDT	681
08/10/2016 08:15 MDT	681
08/10/2016 08:30 MDT	681
08/10/2016 08:45 MDT	681
08/10/2016 09:00 MDT	681
08/10/2016 09:15 MDT	681
08/10/2016 09:30 MDT	681
08/10/2016 09:45 MDT	681

Rio Grande Mean Flow at Central
Calculated from 11:30 AM on 8/10/16
to 11:30 AM on 8/11/16

703	cfs

08/10/2016 10:00 MDT	681
08/10/2016 10:15 MDT	690
08/10/2016 10:30 MDT	690
08/10/2016 10:45 MDT	690
08/10/2016 11:00 MDT	690
08/10/2016 11:15 MDT	690
08/10/2016 11:30 MDT	690
08/10/2016 11:45 MDT	699
08/10/2016 12:00 MDT	699
08/10/2016 12:15 MDT	707
08/10/2016 12:30 MDT	716
08/10/2016 12:45 MDT	716
08/10/2016 13:00 MDT	725
08/10/2016 13:15 MDT	725
08/10/2016 13:30 MDT	725
08/10/2016 13:45 MDT	725
08/10/2016 14:00 MDT	725
08/10/2016 14:15 MDT	716
08/10/2016 14:30 MDT	716
08/10/2016 14:45 MDT	716
08/10/2016 15:00 MDT	716
08/10/2016 15:15 MDT	707
08/10/2016 15:30 MDT	707
08/10/2016 15:45 MDT	707
08/10/2016 16:00 MDT	699
08/10/2016 16:15 MDT	699
08/10/2016 16:30 MDT	699
08/10/2016 16:45 MDT	690
08/10/2016 17:00 MDT	690
08/10/2016 17:15 MDT	690
08/10/2016 17:30 MDT	690
08/10/2016 17:45 MDT	690
08/10/2016 18:00 MDT	690
08/10/2016 18:15 MDT	699
08/10/2016 18:30 MDT	699
08/10/2016 18:45 MDT	707
08/10/2016 19:00 MDT	716
08/10/2016 19:15 MDT	734
08/10/2016 19:30 MDT	743
08/10/2016 19:45 MDT	752
08/10/2016 20:00 MDT	761
08/10/2016 20:15 MDT	770
08/10/2016 20:30 MDT	779
08/10/2016 20:45 MDT	798
08/10/2016 21:00 MDT	807
08/10/2016 21:15 MDT	826
08/10/2016 21:30 MDT	836

08/10/2016 21:45 MDT	845
08/10/2016 22:00 MDT	855
08/10/2016 22:15 MDT	865
08/10/2016 22:30 MDT	865
08/10/2016 22:45 MDT	855
08/10/2016 23:00 MDT	855
08/10/2016 23:15 MDT	845
08/10/2016 23:30 MDT	836
08/10/2016 23:45 MDT	826
08/11/2016 00:00 MDT	817
08/11/2016 00:15 MDT	798
08/11/2016 00:30 MDT	788
08/11/2016 00:45 MDT	770
08/11/2016 01:00 MDT	761
08/11/2016 01:15 MDT	752
08/11/2016 01:30 MDT	743
08/11/2016 01:45 MDT	734
08/11/2016 02:00 MDT	716
08/11/2016 02:15 MDT	716
08/11/2016 02:30 MDT	716
08/11/2016 02:45 MDT	707
08/11/2016 03:00 MDT	699
08/11/2016 03:15 MDT	690
08/11/2016 03:30 MDT	690
08/11/2016 03:45 MDT	681
08/11/2016 04:00 MDT	681
08/11/2016 04:15 MDT	673
08/11/2016 04:30 MDT	664
08/11/2016 04:45 MDT	664
08/11/2016 05:00 MDT	656
08/11/2016 05:15 MDT	656
08/11/2016 05:30 MDT	648
08/11/2016 05:45 MDT	648
08/11/2016 06:00 MDT	640
08/11/2016 06:15 MDT	640
08/11/2016 06:30 MDT	631
08/11/2016 06:45 MDT	623
08/11/2016 07:00 MDT	623
08/11/2016 07:15 MDT	615
08/11/2016 07:30 MDT	607
08/11/2016 07:45 MDT	607
08/11/2016 08:00 MDT	599
08/11/2016 08:15 MDT	592
08/11/2016 08:30 MDT	592
08/11/2016 08:45 MDT	592
08/11/2016 09:00 MDT	592
08/11/2016 09:15 MDT	584

08/11/2016 09:30 MDT	592
08/11/2016 09:45 MDT	584
08/11/2016 10:00 MDT	584
08/11/2016 10:15 MDT	584
08/11/2016 10:30 MDT	592
08/11/2016 10:45 MDT	592
08/11/2016 11:00 MDT	584
08/11/2016 11:15 MDT	584
08/11/2016 11:30 MDT	584
08/11/2016 11:45 MDT	584
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08/11/2016 12:15 MDT	576
08/11/2016 12:30 MDT	576
08/11/2016 12:45 MDT	576
08/11/2016 13:00 MDT	576
08/11/2016 13:15 MDT	576
08/11/2016 13:30 MDT	576
08/11/2016 13:45 MDT	568
08/11/2016 14:00 MDT	568
08/11/2016 14:15 MDT	568
08/11/2016 14:30 MDT	553
08/11/2016 14:45 MDT	538
08/11/2016 15:00 MDT	524
08/11/2016 15:15 MDT	517
08/11/2016 15:30 MDT	510
08/11/2016 15:45 MDT	502
08/11/2016 16:00 MDT	495
08/11/2016 16:15 MDT	488
08/11/2016 16:30 MDT	482
08/11/2016 16:45 MDT	475
08/11/2016 17:00 MDT	468
08/11/2016 17:15 MDT	468
08/11/2016 17:30 MDT	461
08/11/2016 17:45 MDT	461
08/11/2016 18:00 MDT	454
08/11/2016 18:15 MDT	454
08/11/2016 18:30 MDT	454
08/11/2016 18:45 MDT	448
08/11/2016 19:00 MDT	448
08/11/2016 19:15 MDT	448
08/11/2016 19:30 MDT	448
08/11/2016 19:45 MDT	448
08/11/2016 20:00 MDT	441
08/11/2016 20:15 MDT	441
08/11/2016 20:30 MDT	441
08/11/2016 20:45 MDT	441
08/11/2016 21:00 MDT	441

08/11/2016 21:15 MDT	441
08/11/2016 21:30 MDT	441
08/11/2016 21:45 MDT	441
08/11/2016 22:00 MDT	441
08/11/2016 22:15 MDT	441
08/11/2016 22:30 MDT	441
08/11/2016 22:45 MDT	441
08/11/2016 23:00 MDT	435
08/11/2016 23:15 MDT	435
08/11/2016 23:30 MDT	441
08/11/2016 23:45 MDT	441

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

)&period=&begin_date http://nwis.waterdata.usgs.gov/nwis/uv?cb_00060=on&cb_00065=on&format=ht

Downloaded on 12/14/16

Note: USGS data is provisional and subject to revision

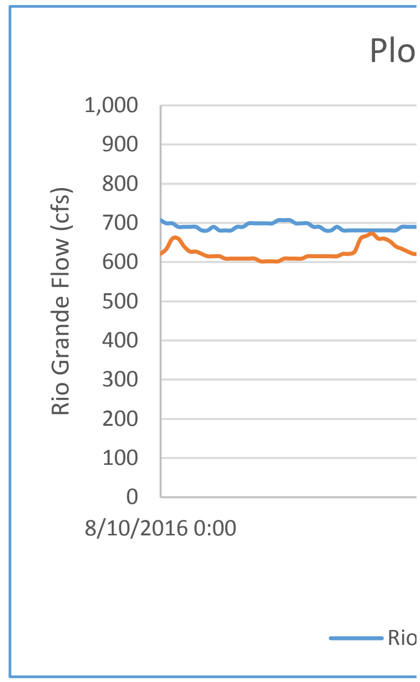
Date/Time	Discharge (cfs)
8/10/2016 0:00	621
8/10/2016 0:15	634
8/10/2016 0:30	660
8/10/2016 0:45	660
8/10/2016 1:00	640
8/10/2016 1:15	627
8/10/2016 1:30	627
8/10/2016 1:45	621
8/10/2016 2:00	615
8/10/2016 2:15	615
8/10/2016 2:30	615
8/10/2016 2:45	609
8/10/2016 3:00	609
8/10/2016 3:15	609
8/10/2016 3:30	609
8/10/2016 3:45	609
8/10/2016 4:00	609
8/10/2016 4:15	602
8/10/2016 4:30	602
8/10/2016 4:45	602
8/10/2016 5:00	602
8/10/2016 5:15	609
8/10/2016 5:30	609
8/10/2016 5:45	609
8/10/2016 6:00	609
8/10/2016 6:15	615
8/10/2016 6:30	615
8/10/2016 6:45	615
8/10/2016 7:00	615
8/10/2016 7:15	615
8/10/2016 7:30	615
8/10/2016 7:45	621
8/10/2016 8:00	621
8/10/2016 8:15	627
8/10/2016 8:30	660
8/10/2016 8:45	667
8/10/2016 9:00	673
8/10/2016 9:15	660
8/10/2016 9:30	660
8/10/2016 9:45	653

Rio Grande Mean Flow Near Alam

Calculated from 11:30 AM on 8/1(

to 11:30 AM on 8/11/16

593	cfs



8/10/2016 10:00	640
8/10/2016 10:15	634
8/10/2016 10:30	627
8/10/2016 10:45	621
8/10/2016 11:00	621
8/10/2016 11:15	621
8/10/2016 11:30	615
8/10/2016 11:45	621
8/10/2016 12:00	621
8/10/2016 12:15	621
8/10/2016 12:30	621
8/10/2016 12:45	627
8/10/2016 13:00	621
8/10/2016 13:15	615
8/10/2016 13:30	621
8/10/2016 13:45	627
8/10/2016 14:00	627
8/10/2016 14:15	627
8/10/2016 14:30	627
8/10/2016 14:45	640
8/10/2016 15:00	667
8/10/2016 15:15	694
8/10/2016 15:30	700
8/10/2016 15:45	700
8/10/2016 16:00	707
8/10/2016 16:15	707
8/10/2016 16:30	707
8/10/2016 16:45	714
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8/10/2016 17:30	714
8/10/2016 17:45	714
8/10/2016 18:00	714
8/10/2016 18:15	714
8/10/2016 18:30	714
8/10/2016 18:45	714
8/10/2016 19:00	707
8/10/2016 19:15	707
8/10/2016 19:30	700
8/10/2016 19:45	673
8/10/2016 20:00	653
8/10/2016 20:15	634
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8/10/2016 20:45	627
8/10/2016 21:00	621
8/10/2016 21:15	615
8/10/2016 21:30	609

8/10/2016 21:45	609
8/10/2016 22:00	609
8/10/2016 22:15	609
8/10/2016 22:30	609
8/10/2016 22:45	609
8/10/2016 23:00	602
8/10/2016 23:15	596
8/10/2016 23:30	596
8/10/2016 23:45	596
8/11/2016 0:00	590
8/11/2016 0:15	590
8/11/2016 0:30	584
8/11/2016 0:45	578
8/11/2016 1:00	572
8/11/2016 1:15	572
8/11/2016 1:30	566
8/11/2016 1:45	560
8/11/2016 2:00	554
8/11/2016 2:15	554
8/11/2016 2:30	548
8/11/2016 2:45	542
8/11/2016 3:00	537
8/11/2016 3:15	537
8/11/2016 3:30	531
8/11/2016 3:45	525
8/11/2016 4:00	520
8/11/2016 4:15	514
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8/11/2016 5:45	554
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8/11/2016 7:00	520
8/11/2016 7:15	514
8/11/2016 7:30	508
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8/11/2016 8:00	508
8/11/2016 8:15	508
8/11/2016 8:30	514
8/11/2016 8:45	514
8/11/2016 9:00	514
8/11/2016 9:15	508

8/11/2016 9:30	508
8/11/2016 9:45	514
8/11/2016 10:00	514
8/11/2016 10:15	514
8/11/2016 10:30	508
8/11/2016 10:45	497
8/11/2016 11:00	492
8/11/2016 11:15	487
8/11/2016 11:30	487
8/11/2016 11:45	481
8/11/2016 12:00	476
8/11/2016 12:15	476
8/11/2016 12:30	476
8/11/2016 12:45	465
8/11/2016 13:00	465
8/11/2016 13:15	455
8/11/2016 13:30	460
8/11/2016 13:45	460
8/11/2016 14:00	460
8/11/2016 14:15	465
8/11/2016 14:30	465
8/11/2016 14:45	471
8/11/2016 15:00	465
8/11/2016 15:15	465
8/11/2016 15:30	471
8/11/2016 15:45	471
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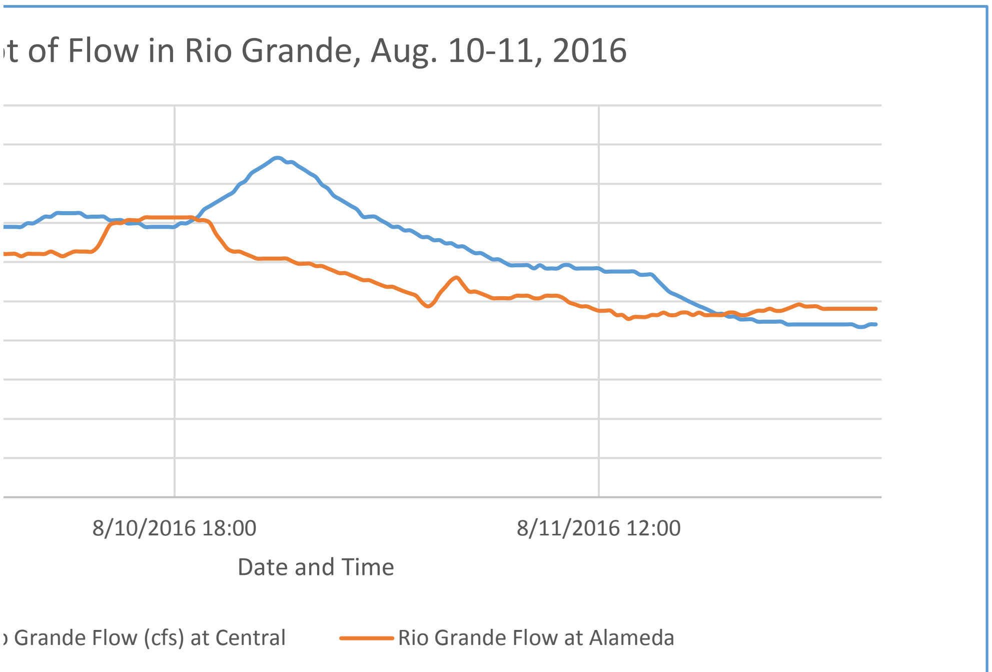
8/11/2016 17:00	465
8/11/2016 17:15	465
8/11/2016 17:30	471
8/11/2016 17:45	471
8/11/2016 18:00	465
8/11/2016 18:15	465
8/11/2016 18:30	471
8/11/2016 18:45	476
8/11/2016 19:00	476
8/11/2016 19:15	481
8/11/2016 19:30	476
8/11/2016 19:45	476
8/11/2016 20:00	481
8/11/2016 20:15	487
8/11/2016 20:30	492
8/11/2016 20:45	487
8/11/2016 21:00	487

8/11/2016 21:15	487
8/11/2016 21:30	481
8/11/2016 21:45	481
8/11/2016 22:00	481
8/11/2016 22:15	481
8/11/2016 22:30	481
8/11/2016 22:45	481
8/11/2016 23:00	481
8/11/2016 23:15	481
8/11/2016 23:30	481
8/11/2016 23:45	481

tml&site_no=08329928&period=&begin_date=2016-08-10&end_date=2016-08-11

eda
)/16



USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

https://nwis.waterdata.usgs.gov/usa/nwis/uv/?cb_00060=on&cb_00065=on&format=rdb&site_no=083

Downloaded on 12/15/16

Note: USGS data is provisional and subject to revision

Date	Time	Discharge (cfs)
9/12/2016	12:00 AM	561
9/12/2016	12:15 AM	584
9/12/2016	12:30 AM	623
9/12/2016	12:45 AM	656
9/12/2016	1:00 AM	681
9/12/2016	1:15 AM	707
9/12/2016	1:30 AM	734
9/12/2016	1:45 AM	743
9/12/2016	2:00 AM	752
9/12/2016	2:15 AM	752
9/12/2016	2:30 AM	752
9/12/2016	2:45 AM	743
9/12/2016	3:00 AM	734
9/12/2016	3:15 AM	734
9/12/2016	3:30 AM	716
9/12/2016	3:45 AM	699
9/12/2016	4:00 AM	681
9/12/2016	4:15 AM	664
9/12/2016	4:30 AM	648
9/12/2016	4:45 AM	623
9/12/2016	5:00 AM	607
9/12/2016	5:15 AM	584
9/12/2016	5:30 AM	568
9/12/2016	5:45 AM	546
9/12/2016	6:00 AM	531
9/12/2016	6:15 AM	517
9/12/2016	6:30 AM	502
9/12/2016	6:45 AM	488
9/12/2016	7:00 AM	475
9/12/2016	7:15 AM	461
9/12/2016	7:30 AM	454
9/12/2016	7:45 AM	441
9/12/2016	8:00 AM	435
9/12/2016	8:15 AM	428
9/12/2016	8:30 AM	428
9/12/2016	8:45 AM	422
9/12/2016	9:00 AM	422
9/12/2016	9:15 AM	422
9/12/2016	9:30 AM	416
9/12/2016	9:45 AM	416

Rio Grande Mean Flow at Central
Calculated from 11:45 AM on 9/12/16
to 11:45 AM on 9/13/16

381	cfs

9/12/2016	10:00 AM	416
9/12/2016	10:15 AM	409
9/12/2016	10:30 AM	409
9/12/2016	10:45 AM	403
9/12/2016	11:00 AM	403
9/12/2016	11:15 AM	397
9/12/2016	11:30 AM	391
9/12/2016	11:45 AM	391
9/12/2016	12:00 PM	385
9/12/2016	12:15 PM	385
9/12/2016	12:30 PM	379
9/12/2016	12:45 PM	379
9/12/2016	1:00 PM	379
9/12/2016	1:15 PM	379
9/12/2016	1:30 PM	379
9/12/2016	1:45 PM	379
9/12/2016	2:00 PM	379
9/12/2016	2:15 PM	379
9/12/2016	2:30 PM	379
9/12/2016	2:45 PM	379
9/12/2016	3:00 PM	379
9/12/2016	3:15 PM	379
9/12/2016	3:30 PM	379
9/12/2016	3:45 PM	379
9/12/2016	4:00 PM	379
9/12/2016	4:15 PM	379
9/12/2016	4:30 PM	373
9/12/2016	4:45 PM	373
9/12/2016	5:00 PM	379
9/12/2016	5:15 PM	379
9/12/2016	5:30 PM	379
9/12/2016	5:45 PM	379
9/12/2016	6:00 PM	379
9/12/2016	6:15 PM	379
9/12/2016	6:30 PM	379
9/12/2016	6:45 PM	385
9/12/2016	7:00 PM	379
9/12/2016	7:15 PM	379
9/12/2016	7:30 PM	379
9/12/2016	7:45 PM	379
9/12/2016	8:00 PM	379
9/12/2016	8:15 PM	379
9/12/2016	8:30 PM	379
9/12/2016	8:45 PM	379
9/12/2016	9:00 PM	379
9/12/2016	9:15 PM	385
9/12/2016	9:30 PM	385

9/12/2016	9:45 PM	385
9/12/2016	10:00 PM	385
9/12/2016	10:15 PM	385
9/12/2016	10:30 PM	391
9/12/2016	10:45 PM	391
9/12/2016	11:00 PM	391
9/12/2016	11:15 PM	391
9/12/2016	11:30 PM	397
9/12/2016	11:45 PM	397
9/13/2016	12:00 AM	397
9/13/2016	12:15 AM	391
9/13/2016	12:30 AM	397
9/13/2016	12:45 AM	397
9/13/2016	1:00 AM	397
9/13/2016	1:15 AM	397
9/13/2016	1:30 AM	397
9/13/2016	1:45 AM	397
9/13/2016	2:00 AM	397
9/13/2016	2:15 AM	397
9/13/2016	2:30 AM	391
9/13/2016	2:45 AM	391
9/13/2016	3:00 AM	391
9/13/2016	3:15 AM	397
9/13/2016	3:30 AM	397
9/13/2016	3:45 AM	397
9/13/2016	4:00 AM	403
9/13/2016	4:15 AM	403
9/13/2016	4:30 AM	403
9/13/2016	4:45 AM	403
9/13/2016	5:00 AM	403
9/13/2016	5:15 AM	403
9/13/2016	5:30 AM	403
9/13/2016	5:45 AM	397
9/13/2016	6:00 AM	397
9/13/2016	6:15 AM	391
9/13/2016	6:30 AM	391
9/13/2016	6:45 AM	385
9/13/2016	7:00 AM	379
9/13/2016	7:15 AM	379
9/13/2016	7:30 AM	379
9/13/2016	7:45 AM	373
9/13/2016	8:00 AM	367
9/13/2016	8:15 AM	367
9/13/2016	8:30 AM	362
9/13/2016	8:45 AM	362
9/13/2016	9:00 AM	356
9/13/2016	9:15 AM	356

9/13/2016	9:30 AM	356
9/13/2016	9:45 AM	356
9/13/2016	10:00 AM	350
9/13/2016	10:15 AM	350
9/13/2016	10:30 AM	350
9/13/2016	10:45 AM	344
9/13/2016	11:00 AM	344
9/13/2016	11:15 AM	344
9/13/2016	11:30 AM	339
9/13/2016	11:45 AM	339
9/13/2016	12:00 PM	339
9/13/2016	12:15 PM	339
9/13/2016	12:30 PM	333
9/13/2016	12:45 PM	333
9/13/2016	1:00 PM	328
9/13/2016	1:15 PM	328
9/13/2016	1:30 PM	328
9/13/2016	1:45 PM	328
9/13/2016	2:00 PM	328
9/13/2016	2:15 PM	328
9/13/2016	2:30 PM	328
9/13/2016	2:45 PM	328
9/13/2016	3:00 PM	328
9/13/2016	3:15 PM	328
9/13/2016	3:30 PM	328
9/13/2016	3:45 PM	328
9/13/2016	4:00 PM	328
9/13/2016	4:15 PM	328
9/13/2016	4:30 PM	328
9/13/2016	4:45 PM	328
9/13/2016	5:00 PM	328
9/13/2016	5:15 PM	328
9/13/2016	5:30 PM	328
9/13/2016	5:45 PM	328
9/13/2016	6:00 PM	328
9/13/2016	6:15 PM	328
9/13/2016	6:30 PM	328
9/13/2016	6:45 PM	328
9/13/2016	7:00 PM	328
9/13/2016	7:15 PM	328
9/13/2016	7:30 PM	328
9/13/2016	7:45 PM	328
9/13/2016	8:00 PM	328
9/13/2016	8:15 PM	328
9/13/2016	8:30 PM	328
9/13/2016	8:45 PM	328
9/13/2016	9:00 PM	328

9/13/2016	9:15 PM	328
9/13/2016	9:30 PM	328
9/13/2016	9:45 PM	328
9/13/2016	10:00 PM	328
9/13/2016	10:15 PM	328
9/13/2016	10:30 PM	328
9/13/2016	10:45 PM	328
9/13/2016	11:00 PM	328
9/13/2016	11:15 PM	328
9/13/2016	11:30 PM	323
9/13/2016	11:45 PM	323

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

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Note: USGS data is provisional and subject to revision

Date	Time	Discharge (cfs)
9/12/2016	12:00 AM	627
9/12/2016	12:15 AM	627
9/12/2016	12:30 AM	596
9/12/2016	12:45 AM	554
9/12/2016	1:00 AM	531
9/12/2016	1:15 AM	514
9/12/2016	1:30 AM	497
9/12/2016	1:45 AM	487
9/12/2016	2:00 AM	471
9/12/2016	2:15 AM	460
9/12/2016	2:30 AM	455
9/12/2016	2:45 AM	445
9/12/2016	3:00 AM	435
9/12/2016	3:15 AM	430
9/12/2016	3:30 AM	425
9/12/2016	3:45 AM	420
9/12/2016	4:00 AM	425
9/12/2016	4:15 AM	425
9/12/2016	4:30 AM	430
9/12/2016	4:45 AM	430
9/12/2016	5:00 AM	430
9/12/2016	5:15 AM	435
9/12/2016	5:30 AM	455
9/12/2016	5:45 AM	460
9/12/2016	6:00 AM	445
9/12/2016	6:15 AM	435
9/12/2016	6:30 AM	425
9/12/2016	6:45 AM	415
9/12/2016	7:00 AM	392
9/12/2016	7:15 AM	396
9/12/2016	7:30 AM	401
9/12/2016	7:45 AM	406
9/12/2016	8:00 AM	406
9/12/2016	8:15 AM	406
9/12/2016	8:30 AM	406
9/12/2016	8:45 AM	410
9/12/2016	9:00 AM	406
9/12/2016	9:15 AM	410
9/12/2016	9:30 AM	410
9/12/2016	9:45 AM	410

Rio Grande Mean Flow Near Alam
Calculated from 11:45 AM on 9/12
to 11:45 AM on 9/13/16

409	cfs

9/12/2016	10:00 AM	406
9/12/2016	10:15 AM	415
9/12/2016	10:30 AM	420
9/12/2016	10:45 AM	420
9/12/2016	11:00 AM	415
9/12/2016	11:15 AM	410
9/12/2016	11:30 AM	415
9/12/2016	11:45 AM	410
9/12/2016	12:00 PM	415
9/12/2016	12:15 PM	415
9/12/2016	12:30 PM	415
9/12/2016	12:45 PM	415
9/12/2016	1:00 PM	415
9/12/2016	1:15 PM	420
9/12/2016	1:30 PM	415
9/12/2016	1:45 PM	415
9/12/2016	2:00 PM	415
9/12/2016	2:15 PM	415
9/12/2016	2:30 PM	420
9/12/2016	2:45 PM	415
9/12/2016	3:00 PM	425
9/12/2016	3:15 PM	425
9/12/2016	3:30 PM	420
9/12/2016	3:45 PM	415
9/12/2016	4:00 PM	420
9/12/2016	4:15 PM	415
9/12/2016	4:30 PM	420
9/12/2016	4:45 PM	415
9/12/2016	5:00 PM	420
9/12/2016	5:15 PM	420
9/12/2016	5:30 PM	420
9/12/2016	5:45 PM	420
9/12/2016	6:00 PM	420
9/12/2016	6:15 PM	435
9/12/2016	6:30 PM	455
9/12/2016	6:45 PM	450
9/12/2016	7:00 PM	445
9/12/2016	7:15 PM	440
9/12/2016	7:30 PM	430
9/12/2016	7:45 PM	430
9/12/2016	8:00 PM	425
9/12/2016	8:15 PM	425
9/12/2016	8:30 PM	425
9/12/2016	8:45 PM	425
9/12/2016	9:00 PM	430
9/12/2016	9:15 PM	440
9/12/2016	9:30 PM	445

9/12/2016	9:45 PM	445
9/12/2016	10:00 PM	440
9/12/2016	10:15 PM	435
9/12/2016	10:30 PM	430
9/12/2016	10:45 PM	430
9/12/2016	11:00 PM	430
9/12/2016	11:15 PM	430
9/12/2016	11:30 PM	440
9/12/2016	11:45 PM	465
9/13/2016	12:00 AM	476
9/13/2016	12:15 AM	481
9/13/2016	12:30 AM	476
9/13/2016	12:45 AM	465
9/13/2016	1:00 AM	450
9/13/2016	1:15 AM	435
9/13/2016	1:30 AM	420
9/13/2016	1:45 AM	420
9/13/2016	2:00 AM	415
9/13/2016	2:15 AM	410
9/13/2016	2:30 AM	406
9/13/2016	2:45 AM	401
9/13/2016	3:00 AM	396
9/13/2016	3:15 AM	392
9/13/2016	3:30 AM	392
9/13/2016	3:45 AM	387
9/13/2016	4:00 AM	382
9/13/2016	4:15 AM	382
9/13/2016	4:30 AM	378
9/13/2016	4:45 AM	378
9/13/2016	5:00 AM	378
9/13/2016	5:15 AM	378
9/13/2016	5:30 AM	378
9/13/2016	5:45 AM	378
9/13/2016	6:00 AM	382
9/13/2016	6:15 AM	387
9/13/2016	6:30 AM	382
9/13/2016	6:45 AM	382
9/13/2016	7:00 AM	382
9/13/2016	7:15 AM	382
9/13/2016	7:30 AM	378
9/13/2016	7:45 AM	373
9/13/2016	8:00 AM	373
9/13/2016	8:15 AM	373
9/13/2016	8:30 AM	369
9/13/2016	8:45 AM	351
9/13/2016	9:00 AM	347
9/13/2016	9:15 AM	356

9/13/2016	9:30 AM	360
9/13/2016	9:45 AM	364
9/13/2016	10:00 AM	364
9/13/2016	10:15 AM	364
9/13/2016	10:30 AM	364
9/13/2016	10:45 AM	369
9/13/2016	11:00 AM	364
9/13/2016	11:15 AM	364
9/13/2016	11:30 AM	373
9/13/2016	11:45 AM	369
9/13/2016	12:00 PM	364
9/13/2016	12:15 PM	369
9/13/2016	12:30 PM	369
9/13/2016	12:45 PM	369
9/13/2016	1:00 PM	369
9/13/2016	1:15 PM	373
9/13/2016	1:30 PM	369
9/13/2016	1:45 PM	369
9/13/2016	2:00 PM	364
9/13/2016	2:15 PM	369
9/13/2016	2:30 PM	369
9/13/2016	2:45 PM	369
9/13/2016	3:00 PM	369
9/13/2016	3:15 PM	360
9/13/2016	3:30 PM	364
9/13/2016	3:45 PM	364
9/13/2016	4:00 PM	364
9/13/2016	4:15 PM	369
9/13/2016	4:30 PM	364
9/13/2016	4:45 PM	369
9/13/2016	5:00 PM	364
9/13/2016	5:15 PM	369
9/13/2016	5:30 PM	369
9/13/2016	5:45 PM	364
9/13/2016	6:00 PM	364
9/13/2016	6:15 PM	364
9/13/2016	6:30 PM	364
9/13/2016	6:45 PM	364
9/13/2016	7:00 PM	364
9/13/2016	7:15 PM	364
9/13/2016	7:30 PM	364
9/13/2016	7:45 PM	364
9/13/2016	8:00 PM	369
9/13/2016	8:15 PM	373
9/13/2016	8:30 PM	378
9/13/2016	8:45 PM	387
9/13/2016	9:00 PM	392

9/13/2016	9:15 PM	387
9/13/2016	9:30 PM	382
9/13/2016	9:45 PM	382
9/13/2016	10:00 PM	378
9/13/2016	10:15 PM	378
9/13/2016	10:30 PM	378
9/13/2016	10:45 PM	378
9/13/2016	11:00 PM	373
9/13/2016	11:15 PM	373
9/13/2016	11:30 PM	378
9/13/2016	11:45 PM	392

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!/16

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

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Note: USGS data is provisional and subject to revision

Date	Time	Discharge (cfs)
9/21/2016	12:00 AM	243
9/21/2016	1:00 AM	243
9/21/2016	3:00 AM	226
9/21/2016	5:00 AM	248
9/21/2016	7:00 AM	239
9/21/2016	9:00 AM	239
9/21/2016	11:00 AM	239
9/21/2016	1:00 PM	235
9/21/2016	3:00 PM	257
9/21/2016	5:00 PM	257
9/21/2016	7:00 PM	257
9/21/2016	9:00 PM	248
9/21/2016	11:00 PM	253
9/22/2016	12:00 AM	257
9/22/2016	1:00 AM	257
9/22/2016	3:00 AM	257
9/22/2016	5:00 AM	262
9/22/2016	7:00 AM	253
9/22/2016	9:00 AM	243
9/22/2016	11:00 AM	239
9/22/2016	11:45 AM	235
9/22/2016	12:00 PM	235
9/22/2016	12:15 PM	235
9/22/2016	12:30 PM	230
9/22/2016	12:45 PM	230
9/22/2016	1:00 PM	230
9/22/2016	1:15 PM	230
9/22/2016	1:30 PM	230
9/22/2016	1:45 PM	230
9/22/2016	2:00 PM	230
9/22/2016	2:15 PM	230
9/22/2016	2:30 PM	230
9/22/2016	2:45 PM	230
9/22/2016	3:00 PM	230
9/22/2016	3:15 PM	226
9/22/2016	3:30 PM	230
9/22/2016	3:45 PM	226
9/22/2016	4:00 PM	226
9/22/2016	4:15 PM	230
9/22/2016	4:30 PM	230

Rio Grande Mean Flow at Central
Calculated from 11:00 AM on 9/21/16
to 11:00 AM on 9/22/16

251	cfs

9/22/2016	4:45 PM	230
9/22/2016	5:00 PM	230
9/22/2016	5:15 PM	230
9/22/2016	5:30 PM	230
9/22/2016	5:45 PM	230
9/22/2016	6:00 PM	230
9/22/2016	6:15 PM	230
9/22/2016	6:30 PM	230
9/22/2016	6:45 PM	235
9/22/2016	7:00 PM	235
9/22/2016	7:15 PM	235
9/22/2016	7:30 PM	235
9/22/2016	7:45 PM	235
9/22/2016	8:00 PM	235
9/22/2016	8:15 PM	235
9/22/2016	8:30 PM	235
9/22/2016	8:45 PM	235
9/22/2016	9:00 PM	235
9/22/2016	9:15 PM	235
9/22/2016	9:30 PM	235
9/22/2016	9:45 PM	235
9/22/2016	10:00 PM	235
9/22/2016	10:15 PM	235
9/22/2016	10:30 PM	235
9/22/2016	10:45 PM	239
9/22/2016	11:00 PM	235
9/22/2016	11:15 PM	235
9/22/2016	11:30 PM	239
9/22/2016	11:45 PM	239

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

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Note: USGS data is provisional and subject to revision

Date	Time	Discharge (cfs)
9/21/2016	12:00 AM	322
9/21/2016	12:15 AM	334
9/21/2016	12:30 AM	343
9/21/2016	12:45 AM	339
9/21/2016	1:00 AM	330
9/21/2016	1:15 AM	322
9/21/2016	1:30 AM	318
9/21/2016	1:45 AM	314
9/21/2016	2:00 AM	314
9/21/2016	2:15 AM	318
9/21/2016	2:30 AM	318
9/21/2016	2:45 AM	318
9/21/2016	3:00 AM	318
9/21/2016	3:15 AM	322
9/21/2016	3:30 AM	322
9/21/2016	3:45 AM	322
9/21/2016	4:00 AM	322
9/21/2016	4:15 AM	322
9/21/2016	4:30 AM	318
9/21/2016	4:45 AM	318
9/21/2016	5:00 AM	318
9/21/2016	5:15 AM	322
9/21/2016	5:30 AM	318
9/21/2016	5:45 AM	322
9/21/2016	6:00 AM	326
9/21/2016	6:15 AM	334
9/21/2016	6:30 AM	339
9/21/2016	6:45 AM	339
9/21/2016	7:00 AM	334
9/21/2016	7:15 AM	334
9/21/2016	7:30 AM	318
9/21/2016	7:45 AM	306
9/21/2016	8:00 AM	302
9/21/2016	8:15 AM	310
9/21/2016	8:30 AM	314
9/21/2016	8:45 AM	322
9/21/2016	9:00 AM	330
9/21/2016	9:15 AM	343
9/21/2016	9:30 AM	343
9/21/2016	9:45 AM	339

Rio Grande Mean Flow Near Alam
Calculated from 11:00 AM on 9/21
to 11:00 AM on 9/22/16

333	cfs

9/21/2016	10:00 AM	339
9/21/2016	10:15 AM	339
9/21/2016	10:30 AM	339
9/21/2016	10:45 AM	334
9/21/2016	11:00 AM	334
9/21/2016	11:15 AM	330
9/21/2016	11:30 AM	330
9/21/2016	11:45 AM	330
9/21/2016	12:00 PM	334
9/21/2016	12:15 PM	330
9/21/2016	12:30 PM	330
9/21/2016	12:45 PM	334
9/21/2016	1:00 PM	334
9/21/2016	1:15 PM	334
9/21/2016	1:30 PM	334
9/21/2016	1:45 PM	330
9/21/2016	2:00 PM	334
9/21/2016	2:15 PM	330
9/21/2016	2:30 PM	330
9/21/2016	2:45 PM	330
9/21/2016	3:00 PM	330
9/21/2016	3:15 PM	326
9/21/2016	3:30 PM	326
9/21/2016	3:45 PM	322
9/21/2016	4:00 PM	326
9/21/2016	4:15 PM	326
9/21/2016	4:30 PM	322
9/21/2016	4:45 PM	322
9/21/2016	5:00 PM	322
9/21/2016	5:15 PM	322
9/21/2016	5:30 PM	322
9/21/2016	5:45 PM	322
9/21/2016	6:00 PM	326
9/21/2016	6:15 PM	326
9/21/2016	6:30 PM	326
9/21/2016	6:45 PM	330
9/21/2016	7:00 PM	330
9/21/2016	7:15 PM	330
9/21/2016	7:30 PM	330
9/21/2016	7:45 PM	330
9/21/2016	8:00 PM	330
9/21/2016	8:15 PM	330
9/21/2016	8:30 PM	326
9/21/2016	8:45 PM	330
9/21/2016	9:00 PM	326
9/21/2016	9:15 PM	326
9/21/2016	9:30 PM	314

9/21/2016	9:45 PM	326
9/21/2016	10:00 PM	330
9/21/2016	10:15 PM	326
9/21/2016	10:30 PM	330
9/21/2016	10:45 PM	330
9/21/2016	11:00 PM	334
9/21/2016	11:15 PM	334
9/21/2016	11:30 PM	330
9/21/2016	11:45 PM	334
9/22/2016	12:00 AM	351
9/22/2016	12:15 AM	373
9/22/2016	12:30 AM	382
9/22/2016	12:45 AM	373
9/22/2016	1:00 AM	360
9/22/2016	1:15 AM	356
9/22/2016	1:30 AM	347
9/22/2016	1:45 AM	347
9/22/2016	2:00 AM	343
9/22/2016	2:15 AM	339
9/22/2016	2:30 AM	339
9/22/2016	2:45 AM	339
9/22/2016	3:00 AM	339
9/22/2016	3:15 AM	339
9/22/2016	3:30 AM	334
9/22/2016	3:45 AM	334
9/22/2016	4:00 AM	334
9/22/2016	4:15 AM	334
9/22/2016	4:30 AM	334
9/22/2016	4:45 AM	334
9/22/2016	5:00 AM	330
9/22/2016	5:15 AM	334
9/22/2016	5:30 AM	334
9/22/2016	5:45 AM	334
9/22/2016	6:00 AM	330
9/22/2016	6:15 AM	330
9/22/2016	6:30 AM	330
9/22/2016	6:45 AM	330
9/22/2016	7:00 AM	330
9/22/2016	7:15 AM	330
9/22/2016	7:30 AM	326
9/22/2016	7:45 AM	326
9/22/2016	8:00 AM	326
9/22/2016	8:15 AM	326
9/22/2016	8:30 AM	330
9/22/2016	8:45 AM	334
9/22/2016	9:00 AM	330
9/22/2016	9:15 AM	330

9/22/2016	9:30 AM	334
9/22/2016	9:45 AM	330
9/22/2016	10:00 AM	330
9/22/2016	10:15 AM	330
9/22/2016	10:30 AM	334
9/22/2016	10:45 AM	330
9/22/2016	11:00 AM	334
9/22/2016	11:15 AM	339
9/22/2016	11:30 AM	334
9/22/2016	11:45 AM	334
9/22/2016	12:00 PM	339
9/22/2016	12:15 PM	343
9/22/2016	12:30 PM	339
9/22/2016	12:45 PM	343
9/22/2016	1:00 PM	339
9/22/2016	1:15 PM	343
9/22/2016	1:30 PM	339
9/22/2016	1:45 PM	343
9/22/2016	2:00 PM	343
9/22/2016	2:15 PM	343
9/22/2016	2:30 PM	343
9/22/2016	2:45 PM	339
9/22/2016	3:00 PM	343
9/22/2016	3:15 PM	339
9/22/2016	3:30 PM	334

no=08329928&period=&begin_date=2016-09-21&end_date=2016-09-22

eda
l/16

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

https://nwis.waterdata.usgs.gov/usa/nwis/uv/?cb_00060=on&cb_00065=on&format=rdb&site_no=0

Downloaded on 1/11/17

Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
11/21/2016 0:00	725
11/21/2016 0:15	734
11/21/2016 0:30	743
11/21/2016 0:45	752
11/21/2016 1:00	761
11/21/2016 1:15	761
11/21/2016 1:30	761
11/21/2016 1:45	770
11/21/2016 2:00	770
11/21/2016 2:15	770
11/21/2016 2:30	770
11/21/2016 2:45	761
11/21/2016 3:00	752
11/21/2016 3:15	752
11/21/2016 3:30	752
11/21/2016 3:45	734
11/21/2016 4:00	716
11/21/2016 4:15	699
11/21/2016 4:30	681
11/21/2016 4:45	673
11/21/2016 5:00	664
11/21/2016 5:15	656
11/21/2016 5:30	648
11/21/2016 5:45	640
11/21/2016 6:00	640
11/21/2016 6:15	640
11/21/2016 6:30	631
11/21/2016 6:45	631
11/21/2016 7:00	640
11/21/2016 7:15	640
11/21/2016 7:30	640
11/21/2016 7:45	640
11/21/2016 8:00	640
11/21/2016 8:15	640
11/21/2016 8:30	648
11/21/2016 8:45	648
11/21/2016 9:00	648
11/21/2016 9:15	648
11/21/2016 9:30	648
11/21/2016 9:45	648
11/21/2016 10:00	648

Rio Grande Mean Flow at Central
Calculated from 9:30 AM on 11/21/16
to 9:30 AM on 11/22/16

853	cfs

11/21/2016 10:15	648
11/21/2016 10:30	648
11/21/2016 10:45	656
11/21/2016 11:00	656
11/21/2016 11:15	656
11/21/2016 11:30	664
11/21/2016 11:45	664
11/21/2016 12:00	664
11/21/2016 12:15	664
11/21/2016 12:30	664
11/21/2016 12:45	664
11/21/2016 13:00	664
11/21/2016 13:15	664
11/21/2016 13:30	664
11/21/2016 13:45	664
11/21/2016 14:00	664
11/21/2016 14:15	664
11/21/2016 14:30	664
11/21/2016 14:45	664
11/21/2016 15:00	664
11/21/2016 15:15	664
11/21/2016 15:30	664
11/21/2016 15:45	664
11/21/2016 16:00	673
11/21/2016 16:15	664
11/21/2016 16:30	673
11/21/2016 16:45	673
11/21/2016 17:00	673
11/21/2016 17:15	681
11/21/2016 17:30	681
11/21/2016 17:45	681
11/21/2016 18:00	699
11/21/2016 18:15	707
11/21/2016 18:30	743
11/21/2016 18:45	761
11/21/2016 19:00	788
11/21/2016 19:15	798
11/21/2016 19:30	798
11/21/2016 19:45	798
11/21/2016 20:00	817
11/21/2016 20:15	817
11/21/2016 20:30	817
11/21/2016 20:45	826
11/21/2016 21:00	826
11/21/2016 21:15	836
11/21/2016 21:30	845
11/21/2016 21:45	855

11/21/2016 22:00	875
11/21/2016 22:15	885
11/21/2016 22:30	905
11/21/2016 22:45	913
11/21/2016 23:00	928
11/21/2016 23:15	944
11/21/2016 23:30	976
11/21/2016 23:45	1010
11/22/2016 0:00	1040
11/22/2016 0:15	1080
11/22/2016 0:30	1110
11/22/2016 0:45	1140
11/22/2016 1:00	1170
11/22/2016 1:15	1170
11/22/2016 1:30	1190
11/22/2016 1:45	1190
11/22/2016 2:00	1180
11/22/2016 2:15	1160
11/22/2016 2:30	1130
11/22/2016 2:45	1110
11/22/2016 3:00	1100
11/22/2016 3:15	1080
11/22/2016 3:30	1070
11/22/2016 3:45	1050
11/22/2016 4:00	1030
11/22/2016 4:15	1020
11/22/2016 4:30	1000
11/22/2016 4:45	984
11/22/2016 5:00	968
11/22/2016 5:15	952
11/22/2016 5:30	944
11/22/2016 5:45	936
11/22/2016 6:00	928
11/22/2016 6:15	928
11/22/2016 6:30	928
11/22/2016 6:45	928
11/22/2016 7:00	928
11/22/2016 7:15	928
11/22/2016 7:30	936
11/22/2016 7:45	944
11/22/2016 8:00	952
11/22/2016 8:15	952
11/22/2016 8:30	960
11/22/2016 8:45	960
11/22/2016 9:00	968
11/22/2016 9:15	968
11/22/2016 9:30	968

11/22/2016 9:45	968
11/22/2016 10:00	960
11/22/2016 10:15	960
11/22/2016 10:30	952
11/22/2016 10:45	944
11/22/2016 11:00	936
11/22/2016 11:15	928
11/22/2016 11:30	928
11/22/2016 11:45	913
11/22/2016 12:00	895
11/22/2016 12:15	885
11/22/2016 12:30	865
11/22/2016 12:45	845
11/22/2016 13:00	836
11/22/2016 13:15	826
11/22/2016 13:30	807
11/22/2016 13:45	798
11/22/2016 14:00	779
11/22/2016 14:15	770
11/22/2016 14:30	761
11/22/2016 14:45	761
11/22/2016 15:00	752
11/22/2016 15:15	743
11/22/2016 15:30	743
11/22/2016 15:45	743
11/22/2016 16:00	734
11/22/2016 16:15	734
11/22/2016 16:30	734
11/22/2016 16:45	734
11/22/2016 17:00	725
11/22/2016 17:15	725
11/22/2016 17:30	716
11/22/2016 17:45	716
11/22/2016 18:00	716
11/22/2016 18:15	707
11/22/2016 18:30	707
11/22/2016 18:45	707
11/22/2016 19:00	707
11/22/2016 19:15	707
11/22/2016 19:30	707
11/22/2016 19:45	716
11/22/2016 20:00	716
11/22/2016 20:15	716
11/22/2016 20:30	725
11/22/2016 20:45	725
11/22/2016 21:00	734
11/22/2016 21:15	734

11/22/2016 21:30	734
11/22/2016 21:45	734
11/22/2016 22:00	734
11/22/2016 22:15	734
11/22/2016 22:30	743
11/22/2016 22:45	752
11/22/2016 23:00	770
11/22/2016 23:15	770
11/22/2016 23:30	779
11/22/2016 23:45	788

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

https://nwis.waterdata.usgs.gov/nwis/uv?cb_00060=on&cb_00065=on&format=rdb&site_no=08329928&

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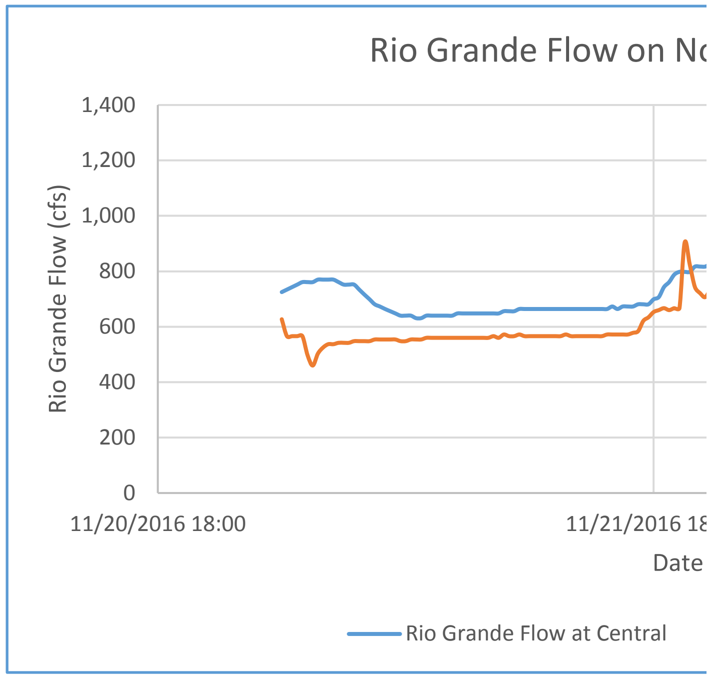
Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
11/21/2016 0:00	627
11/21/2016 0:15	566
11/21/2016 0:30	566
11/21/2016 0:45	566
11/21/2016 1:00	566
11/21/2016 1:15	497
11/21/2016 1:30	460
11/21/2016 1:45	503
11/21/2016 2:00	525
11/21/2016 2:15	537
11/21/2016 2:30	537
11/21/2016 2:45	542
11/21/2016 3:00	542
11/21/2016 3:15	542
11/21/2016 3:30	548
11/21/2016 3:45	548
11/21/2016 4:00	548
11/21/2016 4:15	548
11/21/2016 4:30	554
11/21/2016 4:45	554
11/21/2016 5:00	554
11/21/2016 5:15	554
11/21/2016 5:30	554
11/21/2016 5:45	548
11/21/2016 6:00	548
11/21/2016 6:15	554
11/21/2016 6:30	554
11/21/2016 6:45	554
11/21/2016 7:00	560
11/21/2016 7:15	560
11/21/2016 7:30	560
11/21/2016 7:45	560
11/21/2016 8:00	560
11/21/2016 8:15	560
11/21/2016 8:30	560
11/21/2016 8:45	560
11/21/2016 9:00	560
11/21/2016 9:15	560
11/21/2016 9:30	560
11/21/2016 9:45	560
11/21/2016 10:00	560

Rio Grande Mean Flow at Central
Calculated from 9:30 AM on 11/21/16
to 9:30 AM on 11/22/16

710	cfs



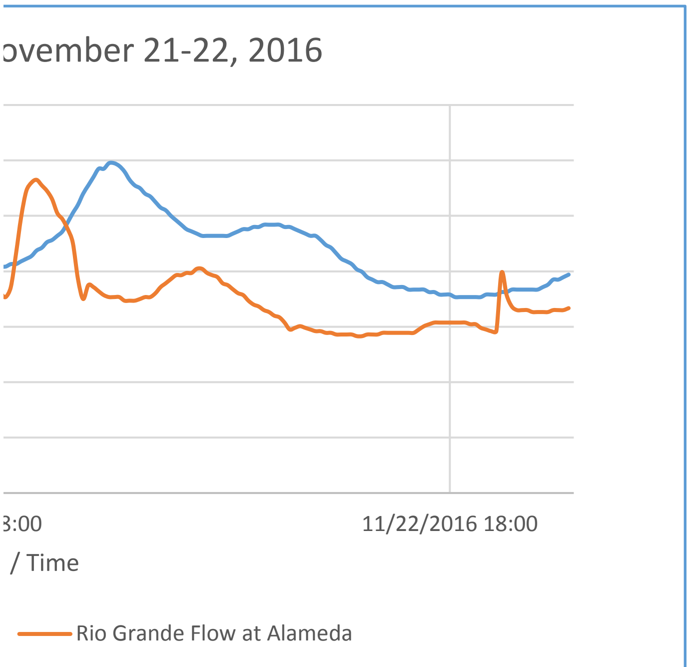
11/21/2016 10:15	566
11/21/2016 10:30	560
11/21/2016 10:45	572
11/21/2016 11:00	566
11/21/2016 11:15	566
11/21/2016 11:30	572
11/21/2016 11:45	566
11/21/2016 12:00	566
11/21/2016 12:15	566
11/21/2016 12:30	566
11/21/2016 12:45	566
11/21/2016 13:00	566
11/21/2016 13:15	566
11/21/2016 13:30	566
11/21/2016 13:45	572
11/21/2016 14:00	566
11/21/2016 14:15	566
11/21/2016 14:30	566
11/21/2016 14:45	566
11/21/2016 15:00	566
11/21/2016 15:15	566
11/21/2016 15:30	566
11/21/2016 15:45	572
11/21/2016 16:00	572
11/21/2016 16:15	572
11/21/2016 16:30	572
11/21/2016 16:45	572
11/21/2016 17:00	578
11/21/2016 17:15	584
11/21/2016 17:30	621
11/21/2016 17:45	634
11/21/2016 18:00	653
11/21/2016 18:15	660
11/21/2016 18:30	667
11/21/2016 18:45	660
11/21/2016 19:00	667
11/21/2016 19:15	667
11/21/2016 19:30	903
11/21/2016 19:45	824
11/21/2016 20:00	743
11/21/2016 20:15	721
11/21/2016 20:30	707
11/21/2016 20:45	743
11/21/2016 21:00	863
11/21/2016 21:15	996
11/21/2016 21:30	1090
11/21/2016 21:45	1120

11/21/2016 22:00	1130
11/21/2016 22:15	1110
11/21/2016 22:30	1090
11/21/2016 22:45	1060
11/21/2016 23:00	1010
11/21/2016 23:15	988
11/21/2016 23:30	953
11/21/2016 23:45	903
11/22/2016 0:00	772
11/22/2016 0:15	700
11/22/2016 0:30	750
11/22/2016 0:45	743
11/22/2016 1:00	728
11/22/2016 1:15	714
11/22/2016 1:30	707
11/22/2016 1:45	707
11/22/2016 2:00	707
11/22/2016 2:15	694
11/22/2016 2:30	694
11/22/2016 2:45	694
11/22/2016 3:00	700
11/22/2016 3:15	707
11/22/2016 3:30	707
11/22/2016 3:45	721
11/22/2016 4:00	743
11/22/2016 4:15	757
11/22/2016 4:30	772
11/22/2016 4:45	786
11/22/2016 5:00	786
11/22/2016 5:15	794
11/22/2016 5:30	794
11/22/2016 5:45	809
11/22/2016 6:00	809
11/22/2016 6:15	794
11/22/2016 6:30	786
11/22/2016 6:45	779
11/22/2016 7:00	757
11/22/2016 7:15	750
11/22/2016 7:30	735
11/22/2016 7:45	721
11/22/2016 8:00	714
11/22/2016 8:15	694
11/22/2016 8:30	680
11/22/2016 8:45	673
11/22/2016 9:00	660
11/22/2016 9:15	653
11/22/2016 9:30	640

11/22/2016 9:45	634
11/22/2016 10:00	615
11/22/2016 10:15	590
11/22/2016 10:30	596
11/22/2016 10:45	602
11/22/2016 11:00	596
11/22/2016 11:15	590
11/22/2016 11:30	584
11/22/2016 11:45	584
11/22/2016 12:00	578
11/22/2016 12:15	578
11/22/2016 12:30	572
11/22/2016 12:45	572
11/22/2016 13:00	572
11/22/2016 13:15	572
11/22/2016 13:30	566
11/22/2016 13:45	566
11/22/2016 14:00	572
11/22/2016 14:15	572
11/22/2016 14:30	572
11/22/2016 14:45	578
11/22/2016 15:00	578
11/22/2016 15:15	578
11/22/2016 15:30	578
11/22/2016 15:45	578
11/22/2016 16:00	578
11/22/2016 16:15	578
11/22/2016 16:30	590
11/22/2016 16:45	602
11/22/2016 17:00	609
11/22/2016 17:15	615
11/22/2016 17:30	615
11/22/2016 17:45	615
11/22/2016 18:00	615
11/22/2016 18:15	615
11/22/2016 18:30	615
11/22/2016 18:45	615
11/22/2016 19:00	609
11/22/2016 19:15	609
11/22/2016 19:30	596
11/22/2016 19:45	590
11/22/2016 20:00	584
11/22/2016 20:15	584
11/22/2016 20:30	794
11/22/2016 20:45	714
11/22/2016 21:00	673
11/22/2016 21:15	660

11/22/2016 21:30	660
11/22/2016 21:45	660
11/22/2016 22:00	653
11/22/2016 22:15	653
11/22/2016 22:30	653
11/22/2016 22:45	653
11/22/2016 23:00	660
11/22/2016 23:15	660
11/22/2016 23:30	660
11/22/2016 23:45	667

:period=&begin_date=2016-09-21&end_date=2016-09-22



USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

https://nwis.waterdata.usgs.gov/usa/nwis/uv/?cb_00060=on&cb_00065=on&format=rdb&site_no=08

Downloaded on 12/16/16

Note: "P" designates USGS data is provisional and subject to revision

Date	Time	Discharge (cfs)	
7/6/2016	12:00 AM	623	P
7/6/2016	12:15 AM	623	P
7/6/2016	12:30 AM	615	P
7/6/2016	12:45 AM	623	P
7/6/2016	1:00 AM	615	P
7/6/2016	1:15 AM	615	P
7/6/2016	1:30 AM	615	P
7/6/2016	1:45 AM	607	P
7/6/2016	2:00 AM	607	P
7/6/2016	2:15 AM	607	P
7/6/2016	2:30 AM	607	P
7/6/2016	2:45 AM	607	P
7/6/2016	3:00 AM	607	P
7/6/2016	3:15 AM	607	P
7/6/2016	3:30 AM	615	P
7/6/2016	3:45 AM	623	P
7/6/2016	4:00 AM	623	P
7/6/2016	4:15 AM	623	P
7/6/2016	4:30 AM	623	P
7/6/2016	4:45 AM	623	P
7/6/2016	5:00 AM	623	P
7/6/2016	5:15 AM	623	P
7/6/2016	5:30 AM	623	P
7/6/2016	5:45 AM	623	P
7/6/2016	6:00 AM	623	P
7/6/2016	6:15 AM	615	P
7/6/2016	6:30 AM	615	P
7/6/2016	6:45 AM	615	P
7/6/2016	7:00 AM	615	P
7/6/2016	7:15 AM	615	P
7/6/2016	7:30 AM	623	P
7/6/2016	7:45 AM	615	P
7/6/2016	8:00 AM	623	P
7/6/2016	8:15 AM	623	P
7/6/2016	8:30 AM	631	P
7/6/2016	8:45 AM	631	P
7/6/2016	9:00 AM	640	P
7/6/2016	9:15 AM	640	P
7/6/2016	9:30 AM	648	P
7/6/2016	9:45 AM	648	P

Rio Grande Mean Flow at Central
Calculated from 12:00 AM on 7/6/16
to 12:00 PM on 7/6/16

631	cfs

7/6/2016	10:00 AM	656	P
7/6/2016	10:15 AM	656	P
7/6/2016	10:30 AM	664	P
7/6/2016	10:45 AM	673	P
7/6/2016	11:00 AM	673	P
7/6/2016	11:15 AM	681	P
7/6/2016	11:30 AM	690	P
7/6/2016	11:45 AM	690	P
7/6/2016	12:00 PM	690	P
7/6/2016	12:15 PM	699	P
7/6/2016	12:30 PM	699	P
7/6/2016	12:45 PM	699	P
7/6/2016	1:00 PM	699	P
7/6/2016	1:15 PM	699	P
7/6/2016	1:30 PM	690	P
7/6/2016	1:45 PM	699	P
7/6/2016	2:00 PM	690	P
7/6/2016	2:15 PM	690	P
7/6/2016	2:30 PM	690	P
7/6/2016	2:45 PM	681	P
7/6/2016	3:00 PM	681	P
7/6/2016	3:15 PM	681	P
7/6/2016	3:30 PM	673	P
7/6/2016	3:45 PM	664	P
7/6/2016	4:00 PM	656	P
7/6/2016	4:15 PM	648	P
7/6/2016	4:30 PM	648	P
7/6/2016	4:45 PM	640	P
7/6/2016	5:00 PM	640	P
7/6/2016	5:15 PM	631	P
7/6/2016	5:30 PM	631	P
7/6/2016	5:45 PM	623	P
7/6/2016	6:00 PM	623	P
7/6/2016	6:15 PM	615	P
7/6/2016	6:30 PM	615	P
7/6/2016	6:45 PM	615	P
7/6/2016	7:00 PM	607	P
7/6/2016	7:15 PM	607	P
7/6/2016	7:30 PM	599	P
7/6/2016	7:45 PM	599	P
7/6/2016	8:00 PM	592	P
7/6/2016	8:15 PM	592	P
7/6/2016	8:30 PM	592	P
7/6/2016	8:45 PM	592	P
7/6/2016	9:00 PM	592	P
7/6/2016	9:15 PM	584	P
7/6/2016	9:30 PM	584	P

7/6/2016	9:45 PM	584	P
7/6/2016	10:00 PM	584	P
7/6/2016	10:15 PM	576	P
7/6/2016	10:30 PM	576	P
7/6/2016	10:45 PM	576	P
7/6/2016	11:00 PM	576	P
7/6/2016	11:15 PM	576	P
7/6/2016	11:30 PM	576	P
7/6/2016	11:45 PM	576	P

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

3330000&p https://nwis.waterdata.usgs.gov/nwis/uv?cb_00060=on&cb_00065=on&format=rdb&site_no=083

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Note: "P" designates USGS data is provisional and subject to revision

Date	Time	Discharge (cfs)	
7/6/2016	12:00 AM	757	P
7/6/2016	12:15 AM	801	P
7/6/2016	12:30 AM	824	P
7/6/2016	12:45 AM	809	P
7/6/2016	1:00 AM	786	P
7/6/2016	1:15 AM	772	P
7/6/2016	1:30 AM	764	P
7/6/2016	1:45 AM	750	P
7/6/2016	2:00 AM	743	P
7/6/2016	2:15 AM	743	P
7/6/2016	2:30 AM	743	P
7/6/2016	2:45 AM	743	P
7/6/2016	3:00 AM	743	P
7/6/2016	3:15 AM	750	P
7/6/2016	3:30 AM	750	P
7/6/2016	3:45 AM	757	P
7/6/2016	4:00 AM	757	P
7/6/2016	4:15 AM	757	P
7/6/2016	4:30 AM	764	P
7/6/2016	4:45 AM	772	P
7/6/2016	5:00 AM	779	P
7/6/2016	5:15 AM	779	P
7/6/2016	5:30 AM	786	P
7/6/2016	5:45 AM	794	P
7/6/2016	6:00 AM	794	P
7/6/2016	6:15 AM	801	P
7/6/2016	6:30 AM	801	P
7/6/2016	6:45 AM	809	P
7/6/2016	7:00 AM	809	P
7/6/2016	7:15 AM	816	P
7/6/2016	7:30 AM	816	P
7/6/2016	7:45 AM	824	P
7/6/2016	8:00 AM	824	P
7/6/2016	8:15 AM	824	P
7/6/2016	8:30 AM	824	P
7/6/2016	8:45 AM	832	P
7/6/2016	9:00 AM	824	P
7/6/2016	9:15 AM	824	P
7/6/2016	9:30 AM	824	P
7/6/2016	9:45 AM	824	P

Rio Grande Mean Flow Near Alameda
Calculated from 12:00 AM on 7/6/16
to 12:00 PM on 7/6/16

772	cfs

7/6/2016	10:00 AM	824	P
7/6/2016	10:15 AM	816	P
7/6/2016	10:30 AM	809	P
7/6/2016	10:45 AM	809	P
7/6/2016	11:00 AM	794	P
7/6/2016	11:15 AM	801	P
7/6/2016	11:30 AM	794	P
7/6/2016	11:45 AM	786	P
7/6/2016	12:00 PM	786	P
7/6/2016	12:15 PM	779	P
7/6/2016	12:30 PM	786	P
7/6/2016	12:45 PM	779	P
7/6/2016	1:00 PM	779	P
7/6/2016	1:15 PM	779	P
7/6/2016	1:30 PM	779	P
7/6/2016	1:45 PM	779	P
7/6/2016	2:00 PM	779	P
7/6/2016	2:15 PM	772	P
7/6/2016	2:30 PM	772	P
7/6/2016	2:45 PM	764	P
7/6/2016	3:00 PM	764	P
7/6/2016	3:15 PM	772	P
7/6/2016	3:30 PM	757	P
7/6/2016	3:45 PM	772	P
7/6/2016	4:00 PM	750	P
7/6/2016	4:15 PM	750	P
7/6/2016	4:30 PM	750	P
7/6/2016	4:45 PM	743	P
7/6/2016	5:00 PM	750	P
7/6/2016	5:15 PM	743	P
7/6/2016	5:30 PM	743	P
7/6/2016	5:45 PM	743	P
7/6/2016	6:00 PM	743	P
7/6/2016	6:15 PM	743	P
7/6/2016	6:30 PM	743	P
7/6/2016	6:45 PM	743	P
7/6/2016	7:00 PM	743	P
7/6/2016	7:15 PM	743	P
7/6/2016	7:30 PM	743	P
7/6/2016	7:45 PM	743	P
7/6/2016	8:00 PM	743	P
7/6/2016	8:15 PM	735	P
7/6/2016	8:30 PM	735	P
7/6/2016	8:45 PM	735	P
7/6/2016	9:00 PM	728	P
7/6/2016	9:15 PM	728	P
7/6/2016	9:30 PM	728	P

7/6/2016	9:45 PM	728	P
7/6/2016	10:00 PM	728	P
7/6/2016	10:15 PM	721	P
7/6/2016	10:30 PM	721	P
7/6/2016	10:45 PM	714	P
7/6/2016	11:00 PM	728	P
7/6/2016	11:15 PM	764	P
7/6/2016	11:30 PM	786	P
7/6/2016	11:45 PM	816	P

329928&period=&begin_date=2016-07-06&end_date=2016-07-06

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

https://nwis.waterdata.usgs.gov/usa/nwis/uv/?cb_00060=on&cb_00065=on&format=rdb&site_no=0

Downloaded on 12/19/17

Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
7/27/2017 0:00	424
7/27/2017 0:15	418
7/27/2017 0:30	418
7/27/2017 0:45	424
7/27/2017 1:00	424
7/27/2017 1:15	430
7/27/2017 1:30	435
7/27/2017 1:45	430
7/27/2017 2:00	430
7/27/2017 2:15	430
7/27/2017 2:30	441
7/27/2017 2:45	441
7/27/2017 3:00	435
7/27/2017 3:15	430
7/27/2017 3:30	430
7/27/2017 3:45	430
7/27/2017 4:00	430
7/27/2017 4:15	424
7/27/2017 4:30	418
7/27/2017 4:45	418
7/27/2017 5:00	413
7/27/2017 5:15	424
7/27/2017 5:30	430
7/27/2017 5:45	430
7/27/2017 6:00	424
7/27/2017 6:15	418
7/27/2017 6:30	418
7/27/2017 6:45	424
7/27/2017 7:00	424
7/27/2017 7:15	413
7/27/2017 7:30	418
7/27/2017 7:45	424
7/27/2017 8:00	424
7/27/2017 8:15	418
7/27/2017 8:30	412
7/27/2017 8:45	412
7/27/2017 9:00	412
7/27/2017 9:15	418
7/27/2017 9:30	418
7/27/2017 9:45	412
7/27/2017 10:00	412

Rio Grande Mean Flow at Central
Calculated from 12:30 PM on 7/27/17
to 12:30 PM on 7/28/17

425	cfs

7/27/2017 10:15	407
7/27/2017 10:30	407
7/27/2017 10:45	412
7/27/2017 11:00	424
7/27/2017 11:15	424
7/27/2017 11:30	424
7/27/2017 11:45	424
7/27/2017 12:00	418
7/27/2017 12:15	412
7/27/2017 12:30	412
7/27/2017 12:45	418
7/27/2017 13:00	424
7/27/2017 13:15	429
7/27/2017 13:30	424
7/27/2017 13:45	429
7/27/2017 14:00	429
7/27/2017 14:15	412
7/27/2017 14:30	407
7/27/2017 14:45	412
7/27/2017 15:00	418
7/27/2017 15:15	424
7/27/2017 15:30	418
7/27/2017 15:45	412
7/27/2017 16:00	412
7/27/2017 16:15	412
7/27/2017 16:30	412
7/27/2017 16:45	418
7/27/2017 17:00	418
7/27/2017 17:15	418
7/27/2017 17:30	407
7/27/2017 17:45	407
7/27/2017 18:00	407
7/27/2017 18:15	407
7/27/2017 18:30	407
7/27/2017 18:45	407
7/27/2017 19:00	407
7/27/2017 19:15	407
7/27/2017 19:30	407
7/27/2017 19:45	407
7/27/2017 20:00	390
7/27/2017 20:15	401
7/27/2017 20:30	395
7/27/2017 20:45	390
7/27/2017 21:00	395
7/27/2017 21:15	395
7/27/2017 21:30	395
7/27/2017 21:45	401

7/27/2017 22:00	401
7/27/2017 22:15	407
7/27/2017 22:30	407
7/27/2017 22:45	401
7/27/2017 23:00	401
7/27/2017 23:15	390
7/27/2017 23:30	390
7/27/2017 23:45	395
7/28/2017 0:00	395
7/28/2017 0:15	401
7/28/2017 0:30	395
7/28/2017 0:45	395
7/28/2017 1:00	390
7/28/2017 1:15	384
7/28/2017 1:30	390
7/28/2017 1:45	395
7/28/2017 2:00	395
7/28/2017 2:15	401
7/28/2017 2:30	401
7/28/2017 2:45	407
7/28/2017 3:00	407
7/28/2017 3:15	407
7/28/2017 3:30	407
7/28/2017 3:45	412
7/28/2017 4:00	423
7/28/2017 4:15	423
7/28/2017 4:30	429
7/28/2017 4:45	441
7/28/2017 5:00	447
7/28/2017 5:15	447
7/28/2017 5:30	447
7/28/2017 5:45	447
7/28/2017 6:00	464
7/28/2017 6:15	458
7/28/2017 6:30	464
7/28/2017 6:45	464
7/28/2017 7:00	464
7/28/2017 7:15	470
7/28/2017 7:30	464
7/28/2017 7:45	452
7/28/2017 8:00	452
7/28/2017 8:15	446
7/28/2017 8:30	446
7/28/2017 8:45	446
7/28/2017 9:00	452
7/28/2017 9:15	452
7/28/2017 9:30	446

7/28/2017 9:45	446
7/28/2017 10:00	452
7/28/2017 10:15	452
7/28/2017 10:30	452
7/28/2017 10:45	452
7/28/2017 11:00	470
7/28/2017 11:15	482
7/28/2017 11:30	488
7/28/2017 11:45	488
7/28/2017 12:00	495
7/28/2017 12:15	508
7/28/2017 12:30	508
7/28/2017 12:45	514
7/28/2017 13:00	508
7/28/2017 13:15	514
7/28/2017 13:30	514
7/28/2017 13:45	514
7/28/2017 14:00	514
7/28/2017 14:15	514
7/28/2017 14:30	514
7/28/2017 14:45	507
7/28/2017 15:00	501
7/28/2017 15:15	495
7/28/2017 15:30	482
7/28/2017 15:45	476
7/28/2017 16:00	470
7/28/2017 16:15	476
7/28/2017 16:30	476
7/28/2017 16:45	464
7/28/2017 17:00	452
7/28/2017 17:15	452
7/28/2017 17:30	452
7/28/2017 17:45	452
7/28/2017 18:00	446
7/28/2017 18:15	440
7/28/2017 18:30	446
7/28/2017 18:45	452
7/28/2017 19:00	446
7/28/2017 19:15	446
7/28/2017 19:30	458
7/28/2017 19:45	470
7/28/2017 20:00	482
7/28/2017 20:15	482
7/28/2017 20:30	482
7/28/2017 20:45	494
7/28/2017 21:00	501
7/28/2017 21:15	507

7/28/2017 21:30	514
7/28/2017 21:45	520
7/28/2017 22:00	514
7/28/2017 22:15	520
7/28/2017 22:30	514
7/28/2017 22:45	520
7/28/2017 23:00	520
7/28/2017 23:15	527
7/28/2017 23:30	534
7/28/2017 23:45	534

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

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Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
7/27/2017 0:00	482
7/27/2017 0:15	482
7/27/2017 0:30	482
7/27/2017 0:45	482
7/27/2017 1:00	482
7/27/2017 1:15	477
7/27/2017 1:30	477
7/27/2017 1:45	477
7/27/2017 2:00	477
7/27/2017 2:15	472
7/27/2017 2:30	477
7/27/2017 2:45	472
7/27/2017 3:00	472
7/27/2017 3:15	468
7/27/2017 3:30	472
7/27/2017 3:45	472
7/27/2017 4:00	468
7/27/2017 4:15	468
7/27/2017 4:30	468
7/27/2017 4:45	463
7/27/2017 5:00	463
7/27/2017 5:15	463
7/27/2017 5:30	463
7/27/2017 5:45	463
7/27/2017 6:00	463
7/27/2017 6:15	458
7/27/2017 6:30	458
7/27/2017 6:45	458
7/27/2017 7:00	458
7/27/2017 7:15	458
7/27/2017 7:30	454
7/27/2017 7:45	458
7/27/2017 8:00	458
7/27/2017 8:15	458
7/27/2017 8:30	454
7/27/2017 8:45	454
7/27/2017 9:00	458
7/27/2017 9:15	454
7/27/2017 9:30	454
7/27/2017 9:45	454
7/27/2017 10:00	458

Rio Grande Mean Flow at Central
Calculated from 12:30 PM on 7/27/17
to 12:30 PM on 7/28/17

496	cfs

7/27/2017 10:15	458
7/27/2017 10:30	458
7/27/2017 10:45	458
7/27/2017 11:00	458
7/27/2017 11:15	463
7/27/2017 11:30	463
7/27/2017 11:45	463
7/27/2017 12:00	463
7/27/2017 12:15	463
7/27/2017 12:30	463
7/27/2017 12:45	463
7/27/2017 13:00	463
7/27/2017 13:15	468
7/27/2017 13:30	468
7/27/2017 13:45	468
7/27/2017 14:00	468
7/27/2017 14:15	463
7/27/2017 14:30	463
7/27/2017 14:45	463
7/27/2017 15:00	463
7/27/2017 15:15	463
7/27/2017 15:30	463
7/27/2017 15:45	458
7/27/2017 16:00	458
7/27/2017 16:15	458
7/27/2017 16:30	458
7/27/2017 16:45	458
7/27/2017 17:00	458
7/27/2017 17:15	458
7/27/2017 17:30	458
7/27/2017 17:45	458
7/27/2017 18:00	458
7/27/2017 18:15	463
7/27/2017 18:30	458
7/27/2017 18:45	458
7/27/2017 19:00	458
7/27/2017 19:15	458
7/27/2017 19:30	458
7/27/2017 19:45	454
7/27/2017 20:00	454
7/27/2017 20:15	458
7/27/2017 20:30	454
7/27/2017 20:45	454
7/27/2017 21:00	454
7/27/2017 21:15	454
7/27/2017 21:30	454
7/27/2017 21:45	454

7/27/2017 22:00	458
7/27/2017 22:15	458
7/27/2017 22:30	454
7/27/2017 22:45	454
7/27/2017 23:00	458
7/27/2017 23:15	458
7/27/2017 23:30	458
7/27/2017 23:45	463
7/28/2017 0:00	506
7/28/2017 0:15	542
7/28/2017 0:30	557
7/28/2017 0:45	542
7/28/2017 1:00	526
7/28/2017 1:15	521
7/28/2017 1:30	521
7/28/2017 1:45	521
7/28/2017 2:00	521
7/28/2017 2:15	521
7/28/2017 2:30	521
7/28/2017 2:45	521
7/28/2017 3:00	516
7/28/2017 3:15	511
7/28/2017 3:30	506
7/28/2017 3:45	501
7/28/2017 4:00	496
7/28/2017 4:15	496
7/28/2017 4:30	492
7/28/2017 4:45	487
7/28/2017 5:00	487
7/28/2017 5:15	487
7/28/2017 5:30	492
7/28/2017 5:45	496
7/28/2017 6:00	506
7/28/2017 6:15	516
7/28/2017 6:30	526
7/28/2017 6:45	537
7/28/2017 7:00	552
7/28/2017 7:15	563
7/28/2017 7:30	568
7/28/2017 7:45	573
7/28/2017 8:00	579
7/28/2017 8:15	579
7/28/2017 8:30	584
7/28/2017 8:45	579
7/28/2017 9:00	579
7/28/2017 9:15	573
7/28/2017 9:30	563

7/28/2017 9:45	557
7/28/2017 10:00	552
7/28/2017 10:15	547
7/28/2017 10:30	542
7/28/2017 10:45	537
7/28/2017 11:00	537
7/28/2017 11:15	526
7/28/2017 11:30	521
7/28/2017 11:45	516
7/28/2017 12:00	511
7/28/2017 12:15	511
7/28/2017 12:30	501
7/28/2017 12:45	506
7/28/2017 13:00	501
7/28/2017 13:15	501
7/28/2017 13:30	496
7/28/2017 13:45	496
7/28/2017 14:00	496
7/28/2017 14:15	496
7/28/2017 14:30	492
7/28/2017 14:45	496
7/28/2017 15:00	506
7/28/2017 15:15	547
7/28/2017 15:30	568
7/28/2017 15:45	568
7/28/2017 16:00	573
7/28/2017 16:15	584
7/28/2017 16:30	584
7/28/2017 16:45	573
7/28/2017 17:00	573
7/28/2017 17:15	563
7/28/2017 17:30	557
7/28/2017 17:45	563
7/28/2017 18:00	563
7/28/2017 18:15	568
7/28/2017 18:30	568
7/28/2017 18:45	563
7/28/2017 19:00	563
7/28/2017 19:15	563
7/28/2017 19:30	568
7/28/2017 19:45	563
7/28/2017 20:00	568
7/28/2017 20:15	584
7/28/2017 20:30	584
7/28/2017 20:45	584
7/28/2017 21:00	579
7/28/2017 21:15	579

7/28/2017 21:30	579
7/28/2017 21:45	579
7/28/2017 22:00	579
7/28/2017 22:15	584
7/28/2017 22:30	584
7/28/2017 22:45	584
7/28/2017 23:00	584
7/28/2017 23:15	584
7/28/2017 23:30	584
7/28/2017 23:45	584

:period=&begin_date=2016-09-21&end_date=2016-09-22

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM (Central)

https://nwis.waterdata.usgs.gov/usa/nwis/uv/?cb_00060=on&cb_00065=on&format=rdb&site_no=0

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Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
9/27/2017 0:00	597
9/27/2017 0:15	590
9/27/2017 0:30	590
9/27/2017 0:45	590
9/27/2017 1:00	590
9/27/2017 1:15	590
9/27/2017 1:30	583
9/27/2017 1:45	583
9/27/2017 2:00	583
9/27/2017 2:15	590
9/27/2017 2:30	597
9/27/2017 2:45	604
9/27/2017 3:00	597
9/27/2017 3:15	590
9/27/2017 3:30	583
9/27/2017 3:45	583
9/27/2017 4:00	583
9/27/2017 4:15	570
9/27/2017 4:30	563
9/27/2017 4:45	569
9/27/2017 5:00	569
9/27/2017 5:15	556
9/27/2017 5:30	549
9/27/2017 5:45	536
9/27/2017 6:00	529
9/27/2017 6:15	529
9/27/2017 6:30	522
9/27/2017 6:45	516
9/27/2017 7:00	509
9/27/2017 7:15	509
9/27/2017 7:30	496
9/27/2017 7:45	490
9/27/2017 8:00	484
9/27/2017 8:15	478
9/27/2017 8:30	478
9/27/2017 8:45	472
9/27/2017 9:00	466
9/27/2017 9:15	466
9/27/2017 9:30	466
9/27/2017 9:45	460
9/27/2017 10:00	460

Rio Grande Mean Flow at Central
Calculated from 12:00 PM on 9/27/17
to 12:00 PM on 9/28/17

985	cfs

Pre-Storm
Rio Grande Mean Flow at Central
Calculated from 12:00 AM on 9/27/17
to 12:00 PM on 9/27/17

530	cfs

9/27/2017 10:15	465
9/27/2017 10:30	454
9/27/2017 10:45	448
9/27/2017 11:00	442
9/27/2017 11:15	459
9/27/2017 11:30	471
9/27/2017 11:45	477
9/27/2017 12:00	471
9/27/2017 12:15	465
9/27/2017 12:30	465
9/27/2017 12:45	465
9/27/2017 13:00	483
9/27/2017 13:15	483
9/27/2017 13:30	490
9/27/2017 13:45	483
9/27/2017 14:00	471
9/27/2017 14:15	490
9/27/2017 14:30	483
9/27/2017 14:45	496
9/27/2017 15:00	503
9/27/2017 15:15	490
9/27/2017 15:30	496
9/27/2017 15:45	509
9/27/2017 16:00	509
9/27/2017 16:15	516
9/27/2017 16:30	522
9/27/2017 16:45	522
9/27/2017 17:00	516
9/27/2017 17:15	490
9/27/2017 17:30	522
9/27/2017 17:45	569
9/27/2017 18:00	632
9/27/2017 18:15	668
9/27/2017 18:30	690
9/27/2017 18:45	713
9/27/2017 19:00	705
9/27/2017 19:15	698
9/27/2017 19:30	698
9/27/2017 19:45	720
9/27/2017 20:00	728
9/27/2017 20:15	720
9/27/2017 20:30	743
9/27/2017 20:45	743
9/27/2017 21:00	759
9/27/2017 21:15	782
9/27/2017 21:30	814
9/27/2017 21:45	830

9/27/2017 22:00	854
9/27/2017 22:15	870
9/27/2017 22:30	886
9/27/2017 22:45	919
9/27/2017 23:00	994
9/27/2017 23:15	1110
9/27/2017 23:30	1230
9/27/2017 23:45	1360
9/28/2017 0:00	1480
9/28/2017 0:15	1550
9/28/2017 0:30	1620
9/28/2017 0:45	1650
9/28/2017 1:00	1690
9/28/2017 1:15	1680
9/28/2017 1:30	1690
9/28/2017 1:45	1650
9/28/2017 2:00	1670
9/28/2017 2:15	1700
9/28/2017 2:30	1660
9/28/2017 2:45	1620
9/28/2017 3:00	1620
9/28/2017 3:15	1570
9/28/2017 3:30	1560
9/28/2017 3:45	1530
9/28/2017 4:00	1500
9/28/2017 4:15	1450
9/28/2017 4:30	1410
9/28/2017 4:45	1340
9/28/2017 5:00	1320
9/28/2017 5:15	1280
9/28/2017 5:30	1260
9/28/2017 5:45	1230
9/28/2017 6:00	1200
9/28/2017 6:15	1170
9/28/2017 6:30	1130
9/28/2017 6:45	1090
9/28/2017 7:00	1070
9/28/2017 7:15	1050
9/28/2017 7:30	1070
9/28/2017 7:45	1070
9/28/2017 8:00	1070
9/28/2017 8:15	1050
9/28/2017 8:30	1060
9/28/2017 8:45	1060
9/28/2017 9:00	1040
9/28/2017 9:15	1040
9/28/2017 9:30	1050

9/28/2017 9:45	1080
9/28/2017 10:00	1090
9/28/2017 10:15	1060
9/28/2017 10:30	1050
9/28/2017 10:45	1050
9/28/2017 11:00	1060
9/28/2017 11:15	1090
9/28/2017 11:30	1110
9/28/2017 11:45	1130
9/28/2017 12:00	1140
9/28/2017 12:15	1160
9/28/2017 12:30	1210
9/28/2017 12:45	1230
9/28/2017 13:00	1250
9/28/2017 13:15	1250
9/28/2017 13:30	1270
9/28/2017 13:45	1280
9/28/2017 14:00	1310
9/28/2017 14:15	1330
9/28/2017 14:30	1360
9/28/2017 14:45	1360
9/28/2017 15:00	1370
9/28/2017 15:15	1360
9/28/2017 15:30	1340
9/28/2017 15:45	1340
9/28/2017 16:00	1330
9/28/2017 16:15	1330
9/28/2017 16:30	1330
9/28/2017 16:45	1330
9/28/2017 17:00	1320
9/28/2017 17:15	1310
9/28/2017 17:30	1290
9/28/2017 17:45	1250
9/28/2017 18:00	1230
9/28/2017 18:15	1200
9/28/2017 18:30	1190
9/28/2017 18:45	1170
9/28/2017 19:00	1150
9/28/2017 19:15	1130
9/28/2017 19:30	1120
9/28/2017 19:45	1100
9/28/2017 20:00	1070
9/28/2017 20:15	1050
9/28/2017 20:30	1020
9/28/2017 20:45	1000
9/28/2017 21:00	986
9/28/2017 21:15	969

9/28/2017 21:30	944
9/28/2017 21:45	936
9/28/2017 22:00	919
9/28/2017 22:15	911
9/28/2017 22:30	895
9/28/2017 22:45	878
9/28/2017 23:00	862
9/28/2017 23:15	854
9/28/2017 23:30	830
9/28/2017 23:45	838

USGS 08329928 RIO GRANDE NR ALAMEDA, NM

https://nwis.waterdata.usgs.gov/nwis/uv?cb_00060=on&cb_00065=on&format=rdb&site_no=08329928&

Downloaded on 12/19/17

Note: USGS data is provisional and subject to revision

Date/Time	Discharge (cfs)
9/27/2017 0:00	612
9/27/2017 0:15	584
9/27/2017 0:30	557
9/27/2017 0:45	542
9/27/2017 1:00	531
9/27/2017 1:15	531
9/27/2017 1:30	526
9/27/2017 1:45	526
9/27/2017 2:00	521
9/27/2017 2:15	516
9/27/2017 2:30	516
9/27/2017 2:45	511
9/27/2017 3:00	506
9/27/2017 3:15	506
9/27/2017 3:30	501
9/27/2017 3:45	496
9/27/2017 4:00	496
9/27/2017 4:15	492
9/27/2017 4:30	492
9/27/2017 4:45	487
9/27/2017 5:00	487
9/27/2017 5:15	487
9/27/2017 5:30	482
9/27/2017 5:45	482
9/27/2017 6:00	482
9/27/2017 6:15	477
9/27/2017 6:30	477
9/27/2017 6:45	482
9/27/2017 7:00	487
9/27/2017 7:15	492
9/27/2017 7:30	492
9/27/2017 7:45	496
9/27/2017 8:00	496
9/27/2017 8:15	501
9/27/2017 8:30	506
9/27/2017 8:45	511
9/27/2017 9:00	516
9/27/2017 9:15	521
9/27/2017 9:30	526
9/27/2017 9:45	531
9/27/2017 10:00	537

Rio Grande Mean Flow at Central
Calculated from 12:00 PM on 9/27/17
to 12:00 PM on 9/28/17

983	cfs

Pre-Storm
Rio Grande Mean Flow at Central
Calculated from 12:00 AM on 9/27/17
to 12:00 PM on 9/27/17

513	cfs

9/27/2017 10:15	537
9/27/2017 10:30	537
9/27/2017 10:45	531
9/27/2017 11:00	526
9/27/2017 11:15	526
9/27/2017 11:30	526
9/27/2017 11:45	526
9/27/2017 12:00	521
9/27/2017 12:15	521
9/27/2017 12:30	521
9/27/2017 12:45	516
9/27/2017 13:00	516
9/27/2017 13:15	511
9/27/2017 13:30	507
9/27/2017 13:45	507
9/27/2017 14:00	507
9/27/2017 14:15	502
9/27/2017 14:30	502
9/27/2017 14:45	502
9/27/2017 15:00	502
9/27/2017 15:15	502
9/27/2017 15:30	498
9/27/2017 15:45	498
9/27/2017 16:00	498
9/27/2017 16:15	498
9/27/2017 16:30	503
9/27/2017 16:45	503
9/27/2017 17:00	508
9/27/2017 17:15	508
9/27/2017 17:30	519
9/27/2017 17:45	565
9/27/2017 18:00	652
9/27/2017 18:15	701
9/27/2017 18:30	739
9/27/2017 18:45	734
9/27/2017 19:00	728
9/27/2017 19:15	745
9/27/2017 19:30	768
9/27/2017 19:45	780
9/27/2017 20:00	786
9/27/2017 20:15	882
9/27/2017 20:30	1150
9/27/2017 20:45	1440
9/27/2017 21:00	1700
9/27/2017 21:15	1880
9/27/2017 21:30	1960
9/27/2017 21:45	1970

9/27/2017 22:00	1930
9/27/2017 22:15	1850
9/27/2017 22:30	1750
9/27/2017 22:45	1670
9/27/2017 23:00	1610
9/27/2017 23:15	1570
9/27/2017 23:30	1520
9/27/2017 23:45	1480
9/28/2017 0:00	1450
9/28/2017 0:15	1410
9/28/2017 0:30	1340
9/28/2017 0:45	1280
9/28/2017 1:00	1220
9/28/2017 1:15	1170
9/28/2017 1:30	1120
9/28/2017 1:45	1060
9/28/2017 2:00	1010
9/28/2017 2:15	955
9/28/2017 2:30	917
9/28/2017 2:45	879
9/28/2017 3:00	849
9/28/2017 3:15	825
9/28/2017 3:30	813
9/28/2017 3:45	807
9/28/2017 4:00	813
9/28/2017 4:15	831
9/28/2017 4:30	862
9/28/2017 4:45	893
9/28/2017 5:00	925
9/28/2017 5:15	957
9/28/2017 5:30	977
9/28/2017 5:45	990
9/28/2017 6:00	997
9/28/2017 6:15	997
9/28/2017 6:30	984
9/28/2017 6:45	984
9/28/2017 7:00	971
9/28/2017 7:15	958
9/28/2017 7:30	952
9/28/2017 7:45	945
9/28/2017 8:00	952
9/28/2017 8:15	972
9/28/2017 8:30	1010
9/28/2017 8:45	1040
9/28/2017 9:00	1080
9/28/2017 9:15	1120
9/28/2017 9:30	1170

9/28/2017 9:45	1250
9/28/2017 10:00	1300
9/28/2017 10:15	1300
9/28/2017 10:30	1290
9/28/2017 10:45	1280
9/28/2017 11:00	1270
9/28/2017 11:15	1260
9/28/2017 11:30	1250
9/28/2017 11:45	1240
9/28/2017 12:00	1240
9/28/2017 12:15	1260
9/28/2017 12:30	1250
9/28/2017 12:45	1210
9/28/2017 13:00	1190
9/28/2017 13:15	1160
9/28/2017 13:30	1130
9/28/2017 13:45	1110
9/28/2017 14:00	1090
9/28/2017 14:15	1080
9/28/2017 14:30	1060
9/28/2017 14:45	1020
9/28/2017 15:00	1020
9/28/2017 15:15	995
9/28/2017 15:30	963
9/28/2017 15:45	950
9/28/2017 16:00	937
9/28/2017 16:15	925
9/28/2017 16:30	912
9/28/2017 16:45	893
9/28/2017 17:00	875
9/28/2017 17:15	863
9/28/2017 17:30	845
9/28/2017 17:45	827
9/28/2017 18:00	815
9/28/2017 18:15	798
9/28/2017 18:30	781
9/28/2017 18:45	775
9/28/2017 19:00	764
9/28/2017 19:15	759
9/28/2017 19:30	748
9/28/2017 19:45	737
9/28/2017 20:00	726
9/28/2017 20:15	720
9/28/2017 20:30	710
9/28/2017 20:45	704
9/28/2017 21:00	699
9/28/2017 21:15	694

9/28/2017 21:30	684
9/28/2017 21:45	721
9/28/2017 22:00	789
9/28/2017 22:15	842
9/28/2017 22:30	872
9/28/2017 22:45	897
9/28/2017 23:00	909
9/28/2017 23:15	935
9/28/2017 23:30	961
9/28/2017 23:45	1010

:period=&begin_date=2017-09-27&end_date=2017-09-28

Compliance Monitoring Cooperative (CMC)
E. coli Loading Calculation Compared to Waste Load Allocation (WLA)
FY 2017 - Wet Season Wet Weather Sampling

Date: 12/14/16

Storm Event Date: TRIAL - to see how various values impact loading

Trials:

- upstream E. coli concentration = 44 CFU/100 mL (Pueblo Geometric Mean WQS), varied the flow conditions - low - downstream can be 50 CFU/100mL, dry - downstream can be 63 CFU/100mL, ...
- downstream E. coli concentration = 88 CFU/100 mL (Pueblo Single Sample WQS), upstream set at 44 CFU/100 mL (Pueblo Geometric Mean WQS), varied the flow conditions - WLA is NOT acceptable for any flow regime for the southern segment.
- If upstream E. coli is higher than WQS (example - use 100 CFU/100 mL) - the E. coli can be higher than WQS and still have acceptable WLA (looks at the delta).

Table 1
Stormwater Sample Analysis Results for E. coli:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Date & Time of Sample	Date & Time Sample Delivered to HEAL
Rio Grande North		TRIAL	TRIAL
Rio Grande South		TRIAL	TRIAL

Rio Grande Flow:
Table 3
Determination of Storm Event Flow Conditions - As Defined in the WSB MS4 Permit and NMED TMDL Report:

Stream Segment	Stream Name / Related USGS Gage	Flow Conditions (from WSB MS4 Permit Appendix B)				
		High (>3,360 cfs)	Moist (923-3,360 cfs)	Mid (664-929 cfs)	Dry (319-664 cfs)	Low (0-319 cfs)

Calculate E. coli Loading for Rio Grande North and Rio Grande South and Delta in E. coli Loading Between North and South Locations:

Monitoring Location	E. coli Concentration (CFU/100 mL)	Daily Mean Flow (cfs)	E. coli Loading (CFU/day)
Rio Grande North	35.9	639	5.61E+11
Rio Grande South	88	669	1.44E+12
Delta in E. coli Loading Between North and South Locations			8.79E+11

For trials - used 300 cfs for low, 500 cfs for dry, 700 cfs for mid, 1,500 cfs for moist, and 4,000 cfs for high

Compare Storm Event E. coli Loading to WLA for CMC:

Stream Segment	Stream Name / Related USGS Gage	CMC E. coli Loading (CFU/day) for Each Segment	Flow Conditions	WLA for CMC for TRIAL Storm Event	WLA - Exceedance or Acceptable
2105.1_00	***Alameda to Angostura*** Non-Pueblo Alameda Bridge to Angostura Diversion / 08329928 - Rio Grande near Alameda	#REF!		#REF!	#REF!
2105_50	***Isleta to Alameda*** Isleta Pueblo Boundary to Alameda Street Bridge / 0833000 - Rio Grande at Albuquerque, NM (Central)	#REF!		#REF!	#REF!

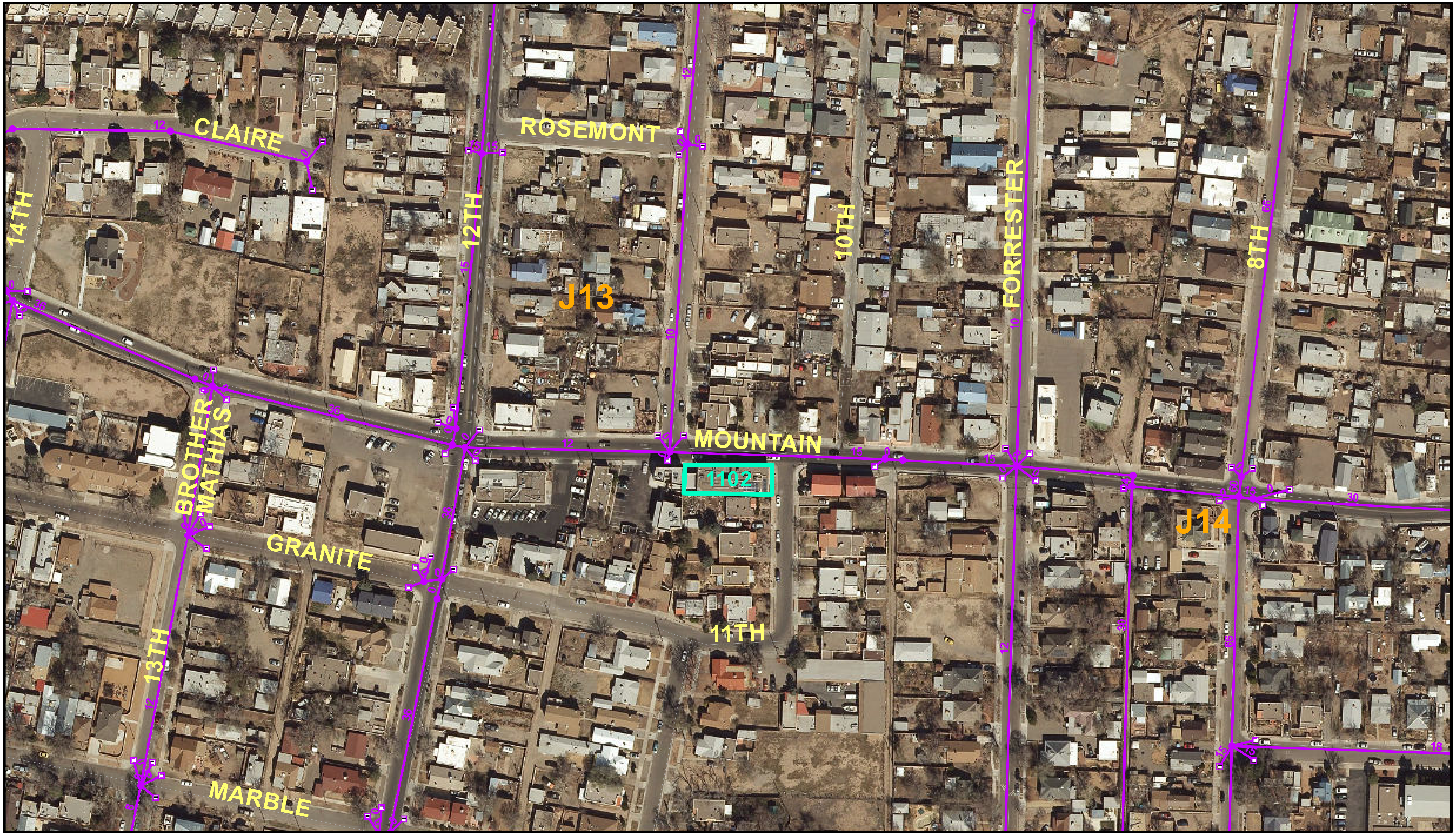
Notes:
1. Refer to "WLAs From NMED" worksheet for WLA for CMC for Storm Event.
2. Flow Conditions were defined in Table 3 "Determination of Storm Event Flow Conditions" above.

US EPA Approved, Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed, June 30, 2010, page 40:

It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load to improve stream water quality and meet water quality criteria should be a goal to be attained. Meeting the calculated TMDL may be a difficult objective.

Attachment 3

Map of Repaired Cross Connections



0 90 180 360
Feet

CROSS CONNECTION CASES
7/1/2017 to 6/30/2018

N

Address

1102 MOUNTAIN NW

Building_type

commercial buildings

SD_size_inch

15

building_name

wired

confirmed_dat

2/8/2018

fixed_date

4/5/2018

cost

$3,900.00

ID

3

who_paid

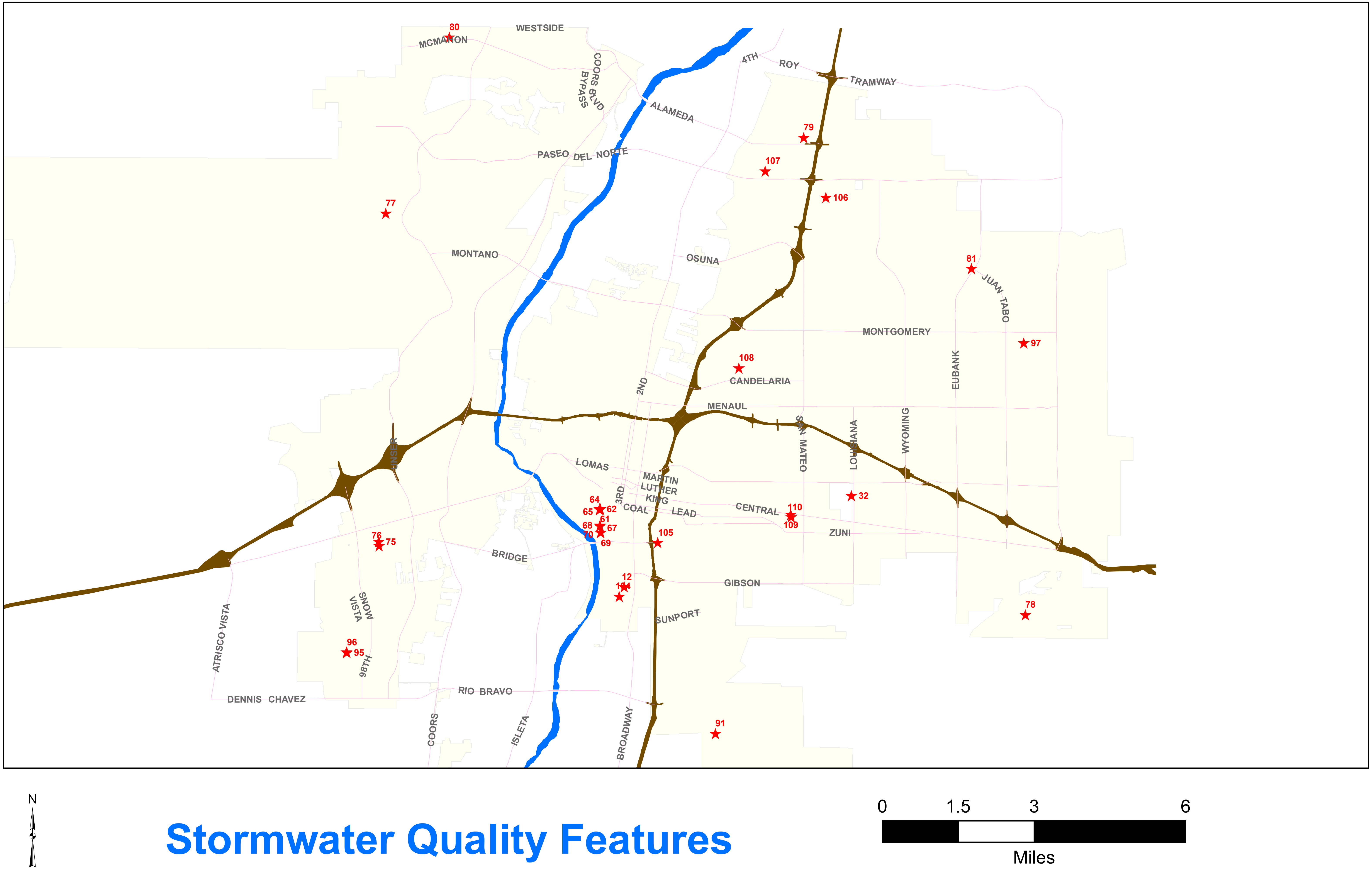
wired (business owner)

video_pict

const_pict

Attachment 4

Listing, Map, and Description of Storm Water Quality Feature

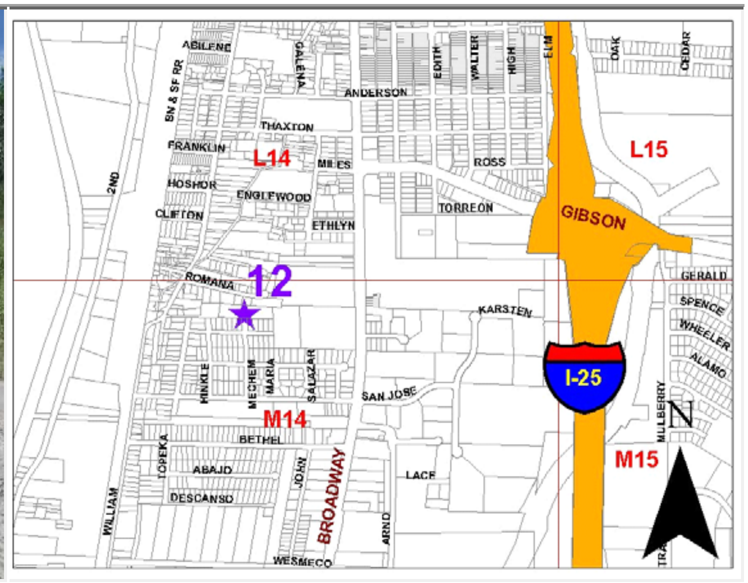


Stormwater Quality Features

SWQ Features

Ported Riser

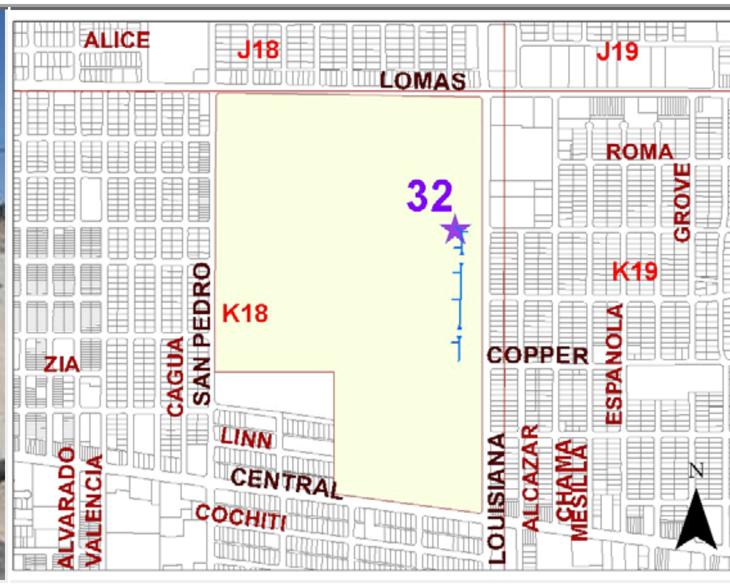
Ported Riser at Mechem Pond



MAP_KEY	M14	City Quad	SE
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	12
PROJECT NO	792602	cost	
NOTES	INSIDE MECHEM'S POND		
RACK SIZE			
UPSTREAM SIZE	POND		
DOWNSTREAM SI	24"RCP		

Ported Riser

Expo NM Pond at LOMAS AND LOUISIANA



MAP_KEY: K18

City Quad: NE

ARROYO: STORM DRAIN

Year_Built: 2015

NUMBER: 32

PROJECT NO: 730491

cost:

NOTES: replace old rack-LOCATED INSIDE NM-EXPO (STATE TAIR GROUND)-730491

RACK SIZE:

UPSTREAM SIZE: POND

DOWNSTREAM SI: 36" ACP

Inlets with Trash Screen

8th west of 717 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	59
PROJECT NO	648391	cost	1000
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

8th st sw west of 717 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	60
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

8th east of 801 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	61
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

801 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	62
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

800 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	63
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

8th east of 800 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	64
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

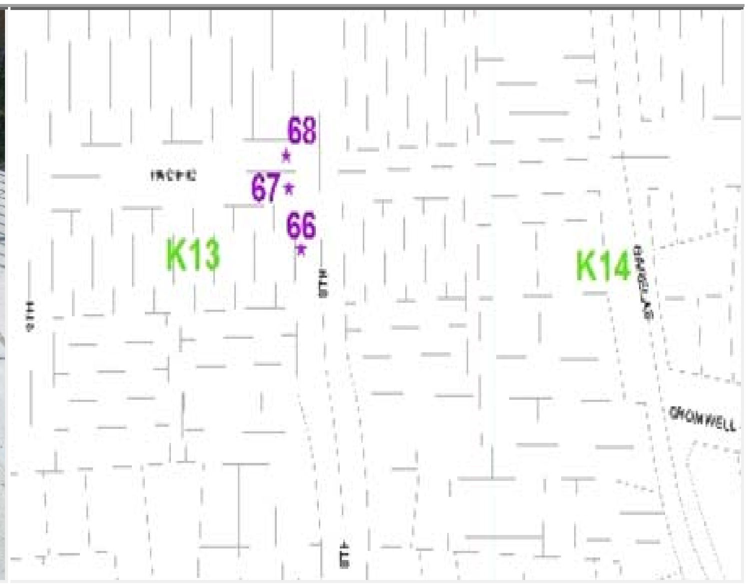
Inlets with Trash Screen

8th west of 724 stover sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	65
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

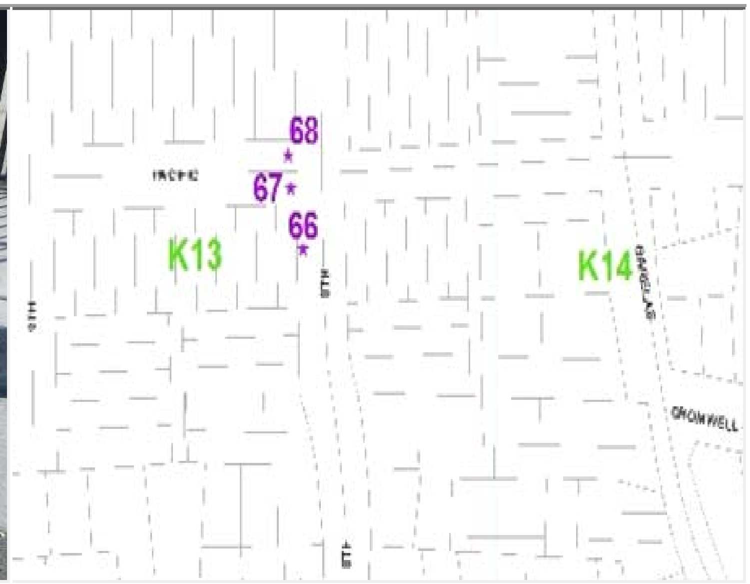
8th east of 800 pacific sw



MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	66
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

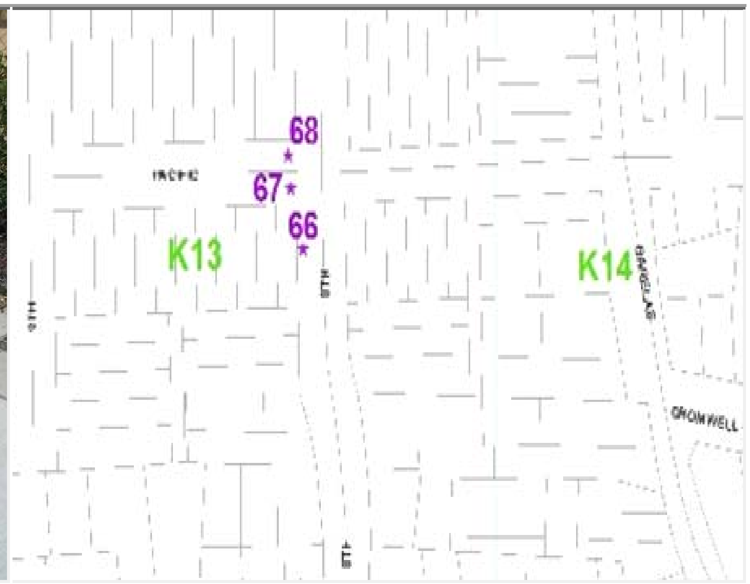
800 pacific sw



MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	67
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

pacific s of 1017 8th sw



MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	68
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlets with Trash Screen

806 Marquez sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	69
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Inlet with Trash Screen

Marquez south of 1223 8th sw

MAP_KEY	K13	City Quad	SW
ARROYO	STORM DRAIN		
Year_Built	2015	NUMBER	70
PROJECT NO	648391	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Trash Screen

90th st se, 150 ft south of sunset gardens se

MAP_KEY	L9	City Quad	SW
ARROYO	ODIN st sw		
Year_Built	2016	NUMBER	75
PROJECT NO		cost	1743
NOTES	3"x3" clear openings-3/4" D bars-5/8"x6" plate-installed by ed on 9-6-2016		
RACK SIZE	3' x 16'		
UPSTREAM SIZE	street		
DOWNSTREAM SI	street		

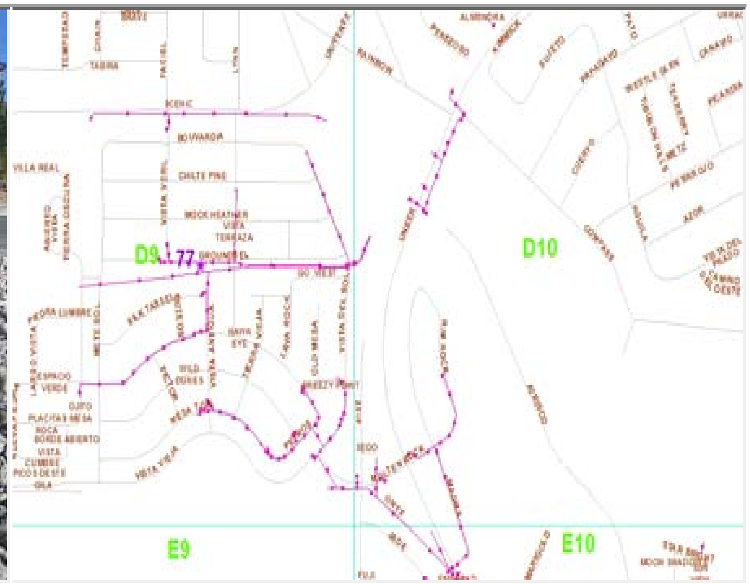
Trash Screen

90th st se, 550 ft south of sunset gardens se

MAP_KEY	L9	City Quad	SW
ARROYO	THOR st SW		
Year_Built	2016	NUMBER	76
PROJECT NO		cost	1743
NOTES	3"x3" clear openings-3/4" D bars-5/8"x6" plate-installed by ed on 9-6-2016		
RACK SIZE	3' x 16'		
UPSTREAM SIZE	street		
DOWNSTREAM SI	street		

Trash Screen

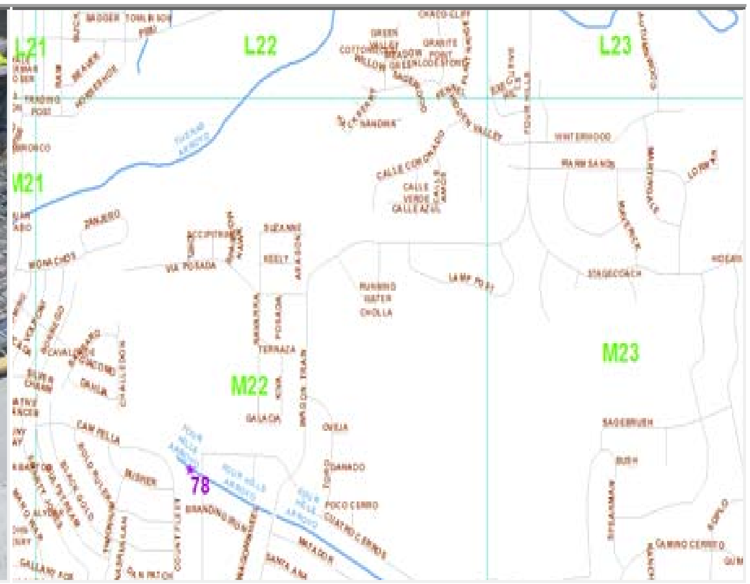
8501 Groundsel nw



MAP_KEY	D9	City Quad	NW
ARROYO	24 in storm drain		
Year_Built	2016	NUMBER	77
PROJECT NO		cost	1678
NOTES	3"x3" clear openings-3/4" D bars-installed by ed on 11-10-2016		
RACK SIZE	19 w1x 48L x 53W2 and 13h x 53w2 in		
UPSTREAM SIZE	pond		
DOWNSTREAM SI	24 in rcp		

Trash Screen

four hills arroyo at sage brush



MAP_KEY	m22	City Quad	se
ARROYO	four hills		
Year_Built	2015	NUMBER	78
PROJECT NO	756392	cost	
NOTES	5 in x 5 in oc spacing and 15 deg from horiz		
RACK SIZE	22'w1x16'w2x11'L+ 22' wx 2'h vertical		
UPSTREAM SIZE	16'w1 x 22' w2 x 5'h		
DOWNSTREAM SI	16'w1 x 22' w2 x 5'h		

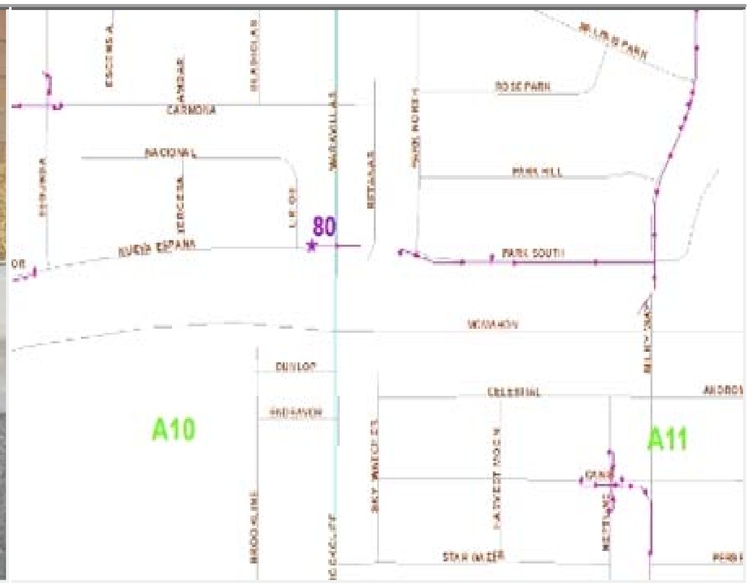
Security Rack

5117 blue sage ne (and san mateo)

MAP_KEY	c17	City Quad	ne
ARROYO	storm drains		
Year_Built	2015	NUMBER	79
PROJECT NO		cost	1535
NOTES	3 cmp security racks		
RACK SIZE	24 in dia		
UPSTREAM SIZE	24 in		
DOWNSTREAM SI	drainage easement channel		

Trash Screen

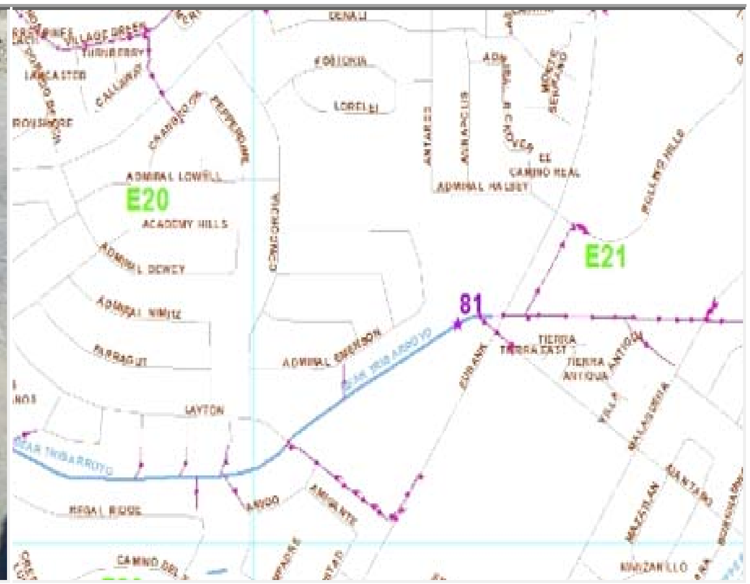
6200 Nueva Espana nw



MAP_KEY	a10	City Quad	nw
ARROYO	storm drain inlet		
Year_Built	2015	NUMBER	80
PROJECT NO		cost	695
NOTES	expanded metal 3/4 in 9 gage		
RACK SIZE	8' x 25 in horiz+12'x6 in vertical		
UPSTREAM SIZE	street		
DOWNSTREAM SI	18 in rcp		

Trash Screen

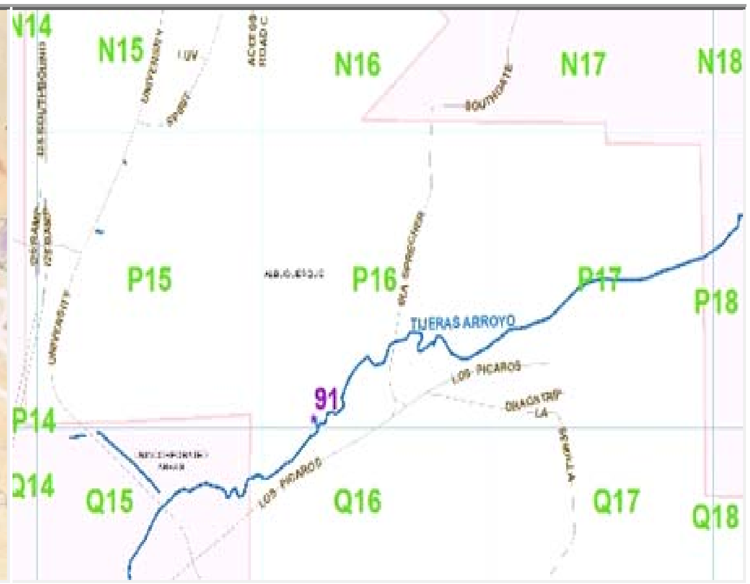
Academy hills park-Eubank and Juan Tabo



MAP_KEY	e21	City Quad	ne
ARROYO	bear trib		
Year_Built	2016	NUMBER	81
PROJECT NO		cost	1923
NOTES	6" spacing, 3/4" bars		
RACK SIZE	2' w x 2' h x 8'L		
UPSTREAM SIZE	arroyo		
DOWNSTREAM SI	underground		

Security Screen

Airport-Tijeras outfall



MAP_KEY	P16	City Quad	se
ARROYO	Tijeras		
Year_Built	2015	NUMBER	91
PROJECT NO		cost	
NOTES	installed by street maintenance after a TV story that a man came out a MH inside the airport		
RACK SIZE	9 ft Dia (108") , 6" x 6" c-c		
UPSTREAM SIZE	108 in		
DOWNSTREAM SI	arroyo		

Trash screen

sierra sunset park-south 54 in pipe

MAP_KEY	n8	City Quad	sw
ARROYO	storm drain		
Year_Built	2015	NUMBER	95
PROJECT NO		cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE	54		
DOWNSTREAM SI	pond		

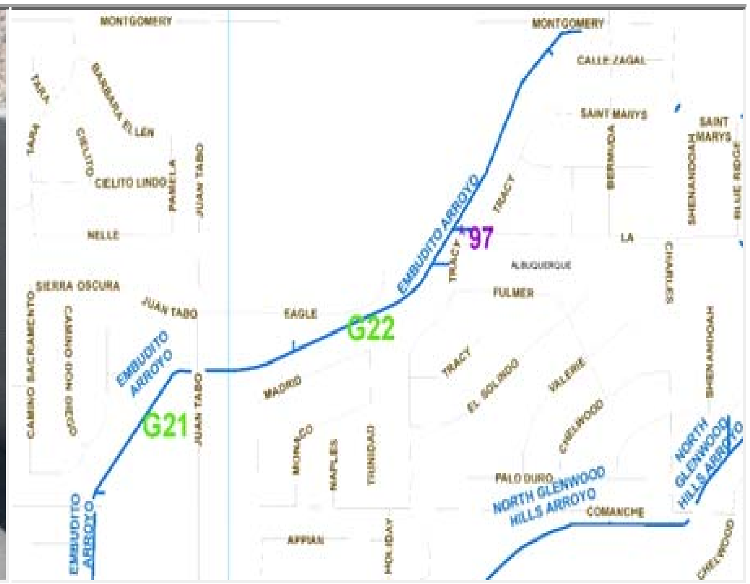
Trash screen

SIERRA SUNSET PARK-NORTH 48 IN PIPE

MAP_KEY	n8	City Quad	sw
ARROYO	storm drain		
Year_Built	2015	NUMBER	96
PROJECT NO		cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE	48		
DOWNSTREAM SI	pond		

Security screen

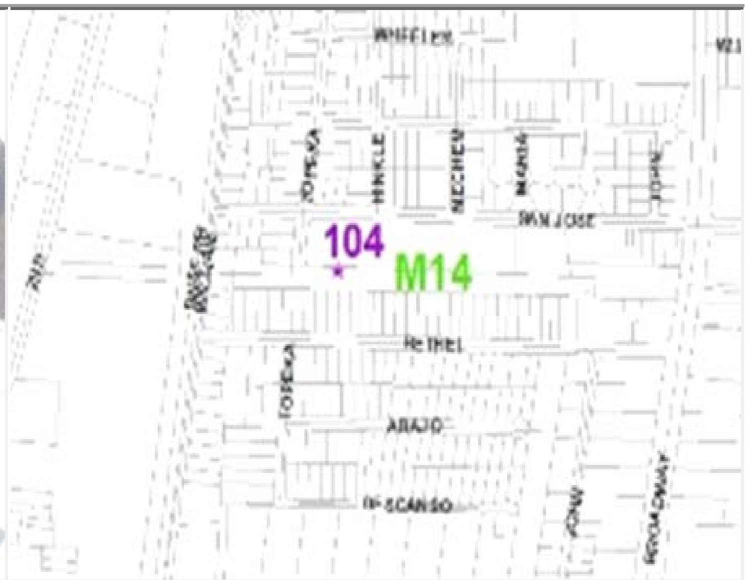
11805 la Charles NE



MAP_KEY	g22	City Quad	ne
ARROYO	storm drain		
Year_Built	2015	NUMBER	97
PROJECT NO		cost	
NOTES			
RACK SIZE	48 in dia		
UPSTREAM SIZE	48		
DOWNSTREAM SI	arroyo		

Stormceptor

Stormceptor at san jose and topeka se



MAP_KEY: M-14

City Quad: SE

ARROYO:

Year_Built: 2015

NUMBER: 104

PROJECT NO: 792602

cost:

NOTES: stc 2400 precast

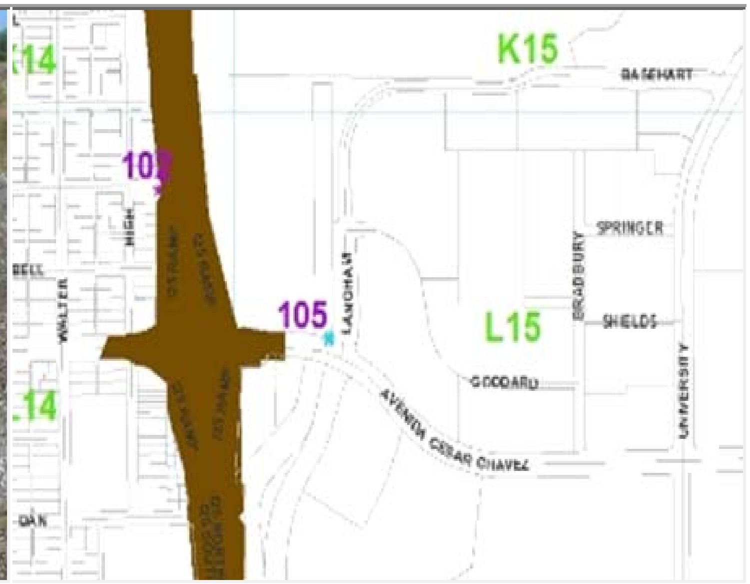
RACK SIZE:

UPSTREAM SIZE:

DOWNSTREAM SI:

SWQ MH

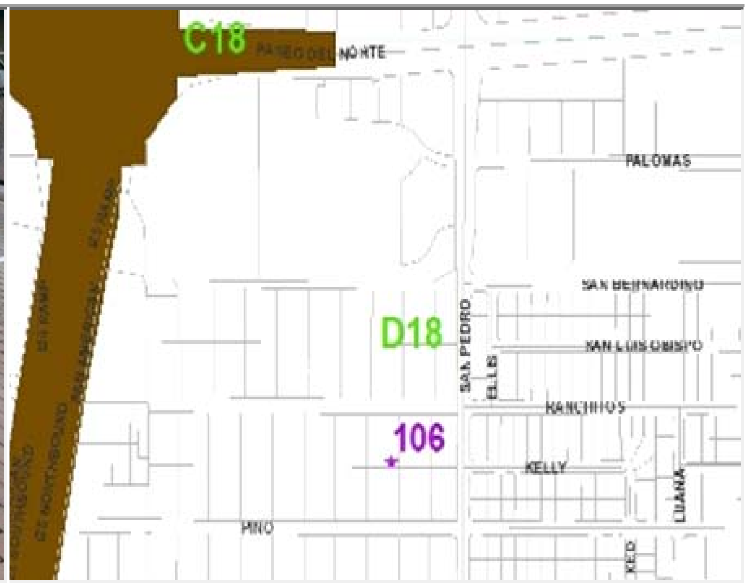
Avanida Cezar Chavez SE at I-25



MAP_KEY	L-15	City Quad	SE
ARROYO			
Year_Built	2015	NUMBER	105
PROJECT NO	501507	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

permeable pavement

pino yard at pino and I-25



MAP_KEY	D-18	City Quad	NW
ARROYO			
Year_Built	2015	NUMBER	106
PROJECT NO	528000	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

SWQ structure

outh Domingo Baca Arroyo west of washington bridg

MAP_KEY	C-17	City Quad	NW
ARROYO			
Year_Built	2015	NUMBER	107
PROJECT NO	800291	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

2 SWQ Inlets

Aztec and Bryn Mawr ne

MAP_KEY	G-16	City Quad	NE
ARROYO			
Year_Built	2017	NUMBER	108
PROJECT NO	784903	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Permeable pavers

Highland Senior Center at 131 Monroe St NE

MAP_KEY	K-17	City Quad	NE
ARROYO			
Year_Built	2016	NUMBER	109
PROJECT NO	658802	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

Bio-Swales

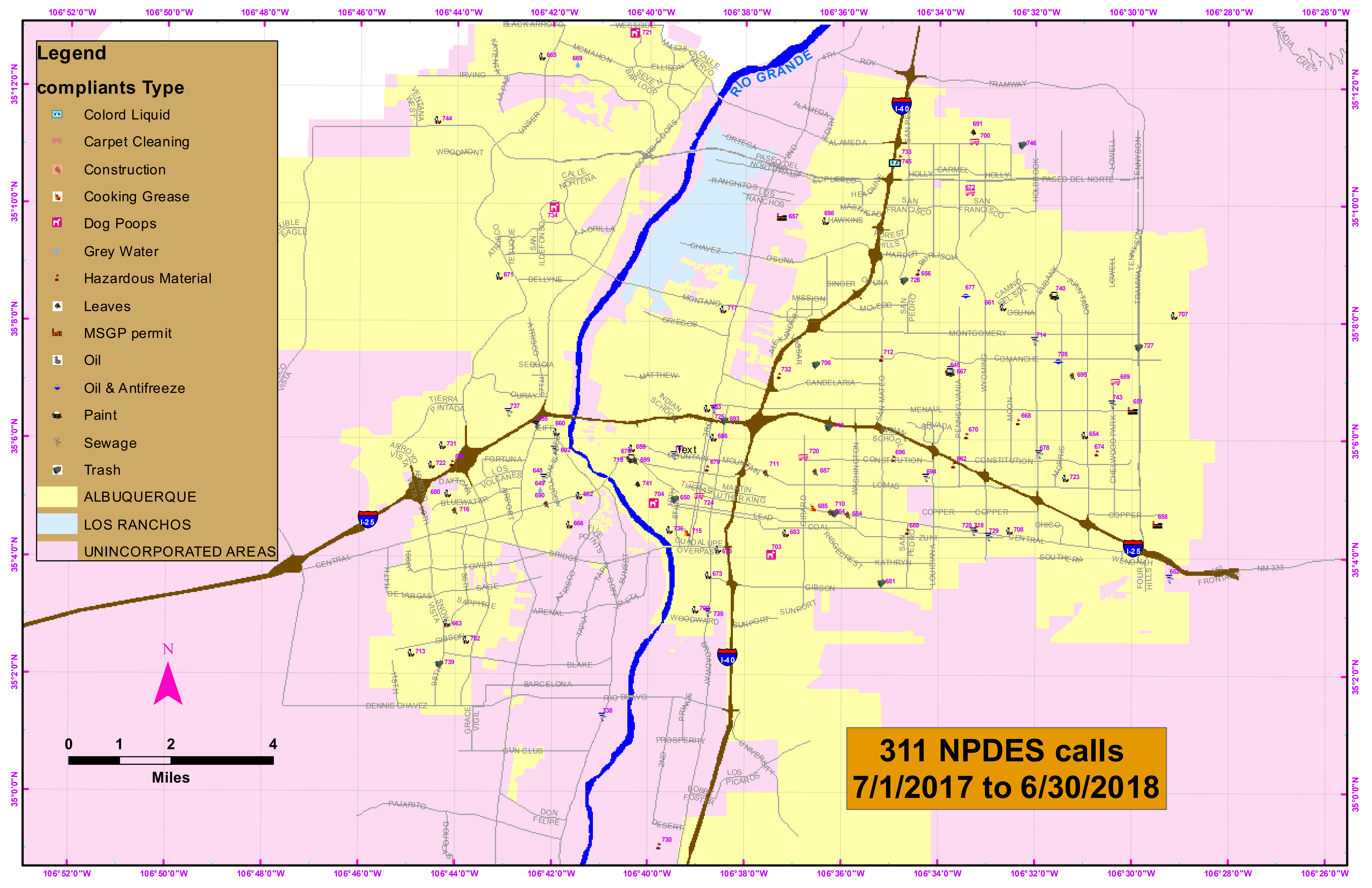
Highland Senior Center at 131 Monroe St NE

MAP_KEY	K-17	City Quad	NE
ARROYO			
Year_Built	2016	NUMBER	110
PROJECT NO	658802	cost	
NOTES			
RACK SIZE			
UPSTREAM SIZE			
DOWNSTREAM SI			

date	year	project	cost	PN
6/21/2011	2011	Louisiana-hahn-security rack	$2,400	
7/5/2011	2011	Amole pond out let rack at 98th and cent	$2,600	
10/13/2011	2011	48 inch rack at 10128 Calle Chulita NW	$2,900	
11/15/2011	2011	south broadway pond rack adjustmewnt	$2,200	
1/4/2012	2012	ported riser design	$52,000	
2/2/2012	2012	odelia tunnels racks	$18,000	
3/13/2012	2012	Dumpester for PS-43 Urban	$1,100	
9/24/2012	2012	ported riser at Piedra Lisa dam	$22,000	440000
1/29/2013	2013	ported riser at Bluewater-Unser pond	$21,000	440003
2/6/2013	2013	ported riser at Odelia pond	$24,000	440004
2/26/2013	2013	trash screen at Ladera16 pond	$15,000	440002
7/11/2013	2013	Dumpester for PS-30 Duranes	$2,300	
11/19/2013	2013	trash screen for ps-36 Princton	$200	
3/31/2014	2014	Pino Yards LID Retrofit	$101,000	528000
9/15/2014	2014	8th St Streetscape Improvements	$1,503,000	648391
10/1/2014	2014	South Broadway Drainage Project WQ	$393,000	792602
12/1/2014	2014	pino yard permeable pavement	$182,000	528002
12/21/2014	2014	Avenida Cesar Chavez Drainage Inlet	$848,000	501507
3/4/2015	2015	Retanas nw-Lions-inlet-screen	$700	
6/9/2015	2015	Louisiana & Lomas SD Improvements	$1,900,000	730491
6/14/2015	2015	Four Hills Arroyo Debris&float Rack	$116,000	756392
6/25/2015	2015	Santa Fe Village Flood Mitigation	$68,000	785604
6/29/2015	2015	safety grate at la Charles NE culvert	$700	
10/9/2015	2015	Siera sunset park- 2 trash racks	$3,300	
10/28/2015	2015	Blake-Amole security gate	$1,200	
11/11/2015	2015	Pollution prevention fish hanger-2000-ct	$1,600	
12/7/2015	2015	adding gate to ladera-16 trsh rack	$2,200	
1/20/2016	2016	Grate at Academy Hills park	$1,900	
9/22/2016	2016	Unser and Paseo Grate	$1,700	
10/6/2016	2016	90th st-sunset gardens-SW-grates	$3,500	
11/22/2016	2016	Highland Senior Center Parking Lot	$387,000	658802
4/19/2017	2017	Bryn Mawr Storm Drain Improvements	$998,000	784903

Attachment 5

Map and Description of 311 Complaints


Legend
compliants Type
Colord Liquid
Carpet Cleaning
Construction
Cooking Grease
Dog Poops
Grey Water
Hazardous Material
Leaves
MSGP permit
Oil
Oil & Antifreeze
Paint
Sewage
Trash
ALBUQUERQUE
LOS RANCHOS
UNINCORPORATED AREAS
N
0 1 2 4
Miles
RIO GRANDE
I-40
I-25
311 NPDES calls
7/1/2017 to 6/30/2018

Address 428 57TH ST NW

EVENT_ID 648 **REPORTING SOURCE** 311 **Complaint_Date** 7/5/2017

CUSTOMER GABRIEL VILLESCAS **311CASE_ID** 170705-002585 **e_mai** gvil8@q.com

CUSTOMER Ph# (505) 610-9742 X_Link: ..\2017\170705-002585-428 57th nw

Complaint: Sewage was dumped in the street by an RV

in_gi ☑

Suspected_Facility RV **Type_of_Complaint** SEWAGE

Inspection_Date 7/6/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio there was an RV parked infront of this vaddress with several spots of dry mud residhe.

INITIAL ACTION the RV has been red taged to be removed soon.pollution prevention brochoures has been distributed at this neighborhood.

Address TIJERAS ARROYO AT OPEN SPACE ROUTE 66

EVENT_ID 652 **REPORTING SOURCE** E-MAIL **Complaint_Date** 7/7/2017

CUSTOMER KALI BRONSON **311CASE_ID** NA **e_mai** kbronson@bernco.gov

CUSTOMER Ph# 848-1544 X_Link: ..\2017\170709-Tijeras at route 66 open space

Complaint: polluting arroyo

in_gi ☑

Suspected_Facility ARROYO **Type_of_Complaint** SEWAGE

Inspection_Date 7/10/2017 **Numberof_FieldVisits** 1 **Inspector:** sk

Facility_Contact NA **Facility Ph. #** na

Field_Observatio I did not see any arroyo blockage. I saw some one living near by the arroyo and possibly they may be blocking the arroyo when there is a running water.

INITIAL ACTION no action

Address	7308 AZTEC RD NE				
EVENT_ID	645	**REPORTING SOURCE**	311	**Complaint_Date**	6/22/2017
CUSTOMER	ANONYMOUS	**311CASE_ID**	170622-001467	**e_mai**	
CUSTOMER Ph#		X_Link:	..\2017\170622-001467-7308 Aztec NE		

Complaint: someone at the address reported is dumping paint and paint debris in the gutter and in the street, caller wanted this looked into.

in_gi ☑

Suspected_Facility	HOME	**Type_of_Complaint**	PAINT		
Inspection_Date	7/13/2017	**Numberof_FieldVisits**	1	**Inspector:**	GS
Facility_Contact	RESIDENT	**Facility Ph. #**			

Field_Observatio There was no evidence of an illicit discharge of salt or paint.

INITIAL ACTION Inspector left a brochure at the address.

Address	314 59TH ST NW
EVENT_ID	649
REPORTING SOURCE	311
Complaint_Date	7/7/2017
CUSTOMER	ANONYMOUS
311CASE_ID	170707-002834
e_mai	
CUSTOMER Ph#	
X_Link:	..\2017\170714 - 314 59th St NW
Complaint:	Hose dripping unknown liquid into gutter
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	GREY WATER
Inspection_Date	7/14/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	RESIDENT
Facility Ph. #	
Field_Observatio	There was no evidence of an illicit discharge.
INITIAL ACTION	A brochure was left on the door of the home.

Address 881 SILVER SW

EVENT_ID 650 **REPORTING SOURCE** WEB **Complaint_Date** 7/17/2017

CUSTOMER CUEVA HOLDER **311CASE_ID** NA **e_mai** cueva@delphi.bm

CUSTOMER Ph# 505-918-3521 X_Link: ..\2017\170719 - 881 Silver SW

Complaint: Hello, I like to report an illegally dumped sofa next to 859 Silver Avenue SW(the Silver Lofts). It has been there at least from the 6th of July.

in_gi ☑

Suspected_Facility **Type_of_Complaint** TRASH

Inspection_Date 7/19/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact **Facility Ph. #**

Field_Observatio Inspector GS searchd the location and didn't find a couch anywhere around property.

INITIAL ACTION

Address	12306 MENAUL NE
EVENT_ID	651
REPORTING SOURCE	311
Complaint_Date	7/17/2017
CUSTOMER	KEVIN BUSICK
311CASE_ID	170717-000656
e_mai	
CUSTOMER Ph#	(505) 321-3177
X_Link:	..\2017\170717- Industrial Letter Call
Complaint:	Citizen received a letter in the mail at his business and he believes it was in error. It references Storm water ms4 and msdp. Unsure what this is for.
in_gi	☑
Suspected_Facility	BUSINESS
Type_of_Complaint	MSGP PERMIT
Inspection_Date	7/19/2017
Numberof_FieldVisits	1
Inspector:	BL
Facility_Contact	OWNER
Facility Ph. #	(505) 321-3177
Field_Observatio	no visit
INITIAL ACTION	inspector called and made contact with Owner and advised him to disregard that letter due to is SIC no longer being under the permit coverage.

Address	2401 4TH ST NW
EVENT_ID	653
REPORTING SOURCE	311
Complaint_Date	7/18/2017
CUSTOMER	ANONYMOUS
311CASE_ID	170718-000321
e_mai	na
CUSTOMER Ph#	na
X_Link:	..\2017\170718-000321 - 2400 4th St NW
Complaint:	Water is draining off commercial property but is contaminated with paint and oil
in_gi	☑
Suspected_Facility	UNITED PAINT AND BODY SHOP
Type_of_Complaint	OIL
Inspection_Date	7/19/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	MANAGER
Facility Ph. #	503-3527
Field_Observatio	the inspector did not see any evidence of an illicit discharge
INITIAL ACTION	inspector spoke to the manager and gave him some pollution prevention brochures.

Address	EMBUDO ARROYO AT INDIAN SCHOOL-JUAN TABO
EVENT_ID	654
REPORTING SOURCE	311
Complaint_Date	7/24/2017
CUSTOMER	JUD BLICKLEY
311CASE_ID	170724-001521
e_mai	
CUSTOMER Ph#	(505) 293-4694
X_Link:	..\2017\170724 - 001521 - Juan Tabo and Indian School
Complaint:	Citizen reports diesel fuel dumped into arroyo just west of intersection Juan Tabo Blvd NE and Indian School Rd NW. put plugged inlet and standing water due to active situation with no other applicable detail options. Citizen say diesel is coming from outlets into arroyo and has went a couple of 100 yards
in_gi	☑
Suspected_Facility	UNKNOWN SOURCE
Type_of_Complaint	OIL
Inspection_Date	7/24/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	NA
Facility Ph. #	na
Field_Observatio	there was a visible oil in the arroyo coming from an outfall storm pipe. Unable to detect the source.
INITIAL ACTION	asked a cleaning company ACT for clean up.

Address BOREALIS ARROYO AT ACADWMY-BURLSON

EVENT_ID 656 **REPORTING SOURCE** 311 **Complaint_Date** 7/25/2017

CUSTOMER ANONYMOUS **311CASE_ID** 170725-001088 **e_mai**

CUSTOMER Ph# na X_Link: ..\2017\170725-001088-Academy & Burlison

Complaint: Illegal Dumping Arroyo off of Burlison south of Academy a tanker truck with name Kelly USDOT 1339377 dumping into the arroyo. Citizen requesting return call, Cathy 505-697-0219.also referred to Police #-242-2677

in_gi ☑

Suspected_Facility KELLY **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 7/25/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact MANAGER **Facility Ph. #** 505-697-0219

Field_Observatio There was no evidence of a discharge of fluids, the canal was dry. However, there was evidence of sand/dirt that was illicitly discharged onto the canal floor.

INITIAL ACTION informed the manager of this dump and they said that it was clean water

Address 200 COLINAS AVE NE

EVENT_ID 657 **REPORTING SOURCE** 311 **Complaint_Date** 7/14/2017

CUSTOMER ERIC MARQUART **311CASE_ID** 170714-000098 **e_mai** marquart_411@msn.com

CUSTOMER Ph# (505) 250-8369 X_Link: ..\2017\170714-000098 Home Based Hauling Industrial Letter Inquiry

Complaint: Citizen has home operated hauling business. Citizen would like to know what they would be insepecting or even if inspection is needed. Citizen resides in County but has permit to operate in the City of Albuquerque.

in_gi ☑

Suspected_Facility BUSINESS **Type_of_Complaint** MSGP PERMIT

Inspection_Date 7/26/2017 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact OWNER **Facility Ph. #** (505) 250-8369

Field_Observatio his business was in the county. Out of Jurisdiction.

INITIAL ACTION asked him to ignore the letter.

Address DENNY'S RESTURANT AT 1602 COORS NW

EVENT_ID 655 **REPORTING SOURCE** E-MAIL **Complaint_Date** 7/24/2017

CUSTOMER ABCWUA-KEVIN DAGGETT **311CASE_ID** NA **e_mai** kdaggett@cabq.gov

CUSTOMER Ph# 505-7682778 X_Link: ..\2017\170724 - email- Denny's SSO Spill

Complaint: sewage overflow

in_gi ☑

Suspected_Facility DENNY'S RESTURANT **Type_of_Complaint** SEWAGE

Inspection_Date 8/1/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact MANAGER **Facility Ph. #**

Field_Observatio there was a big sewage puddle at the sanitary line clean out.

INITIAL ACTION it was fixed on 9-27-2017

Address 14112 MEL SMITH DR NE(OLD ADDRESS 12814 CENTRAL SE)

EVENT_ID 658 **REPORTING SOURCE** 311 **Complaint_Date** 7/25/2017

CUSTOMER LATOYA MILLIGAN **311CASE_ID** 170725-002245 **e_mai** toyamilligan@gmail.com

CUSTOMER Ph# (505) 440-0256 X_Link: ..\2017\170725-002245-MSGP-letter-Dream Factory Industrial

Complaint: Citizen received a letter from Melissa Lozoya with Department of Municipal Development regarding Industrial High Risk Storm Water Pollution Prevention inspection.Citizen is not sure what this is about and would like to speak to the department direct.

in_gi ☑

Suspected_Facility LATOYA MILLIGAN ENTERTAINMENT **Type_of_Complaint** MSGP PERMIT

Inspection_Date 8/3/2017 **Numberof_FieldVisits** 1 **Inspector:** ML

Facility_Contact OWNER **Facility Ph. #** (505) 440-0256

Field_Observatio sic code 792905 Entertainment bureaus, NAICS code 71119007 (other performing arts companies)(2016 businessDB)

INITIAL ACTION the business is a DJ Service and had a different address. Updated in our Business list.this business not required to have MSGP.

Address	2214 DORA NW				
EVENT_ID	659	**REPORTING SOURCE**	311	**Complaint_Date**	8/10/2017
CUSTOMER	ANONYMOUS	**311CASE_ID**	170810-000879	**e_mai**	na
CUSTOMER Ph#	na	X_Link:	..\2017\170810-000879 2207 Dora nw		
Complaint:	Truck in the neighborhood is leaking oil onto the Street for serveral months Parked the wrong way on the street in front of a house for sale . Advised to call the police regarding The parking the Wrong Way . White Chevy pickup 2000 yrs NM plate 401SZL				
in_gi	☑				
Suspected_Facility	HOME	**Type_of_Complaint**	OIL		
Inspection_Date	8/11/2017	**Numberof_FieldVisits**	1	**Inspector:**	AC
Facility_Contact	RESIDENT	**Facility Ph. #**			
Field_Observatio	there was a few minor oil spots at this address				
INITIAL ACTION	the house was for sale, no one was living in. distributed pollution prevention brochures at this neighborhood.				

Address	CARLISLE AND CENTRAL

EVENT_ID	664	REPORTING SOURCE	E-MAIL	Complaint_Date	8/16/2017
CUSTOMER	MARK MCCONNELL	311CASE_ID	NA	e_mai	mmcConnell@cabq.gov
CUSTOMER Ph#		X_Link:	..\2017\170816 - Cental and Carlisle		

Complaint: HB Construction, had pumped their underground parking into Central leaving standing water in front of the Raging Shrimp business at Hermosa on the north side of Central.

in_gi ☑

Suspected_Facility	HB CONSTRUCTION	Type_of_Complaint	CONSTRUCTION

Inspection_Date	8/17/2017	Numberof_FieldVisits	1	Inspector:	BL
Facility_Contact	FOREMAN	Facility Ph. #			

Field_Observatio: there was a big pond of water at this location. The foreman stated that this water from the rain and fire line testing.

INITIAL ACTION: the inspector asked the foreman in call the city when they conduct fire line test.

Address	10500 TAURUS CT NW

EVENT_ID	665	REPORTING SOURCE	311	Complaint_Date	8/30/2017
CUSTOMER	MARK RAMSEY	311CASE_ID	170830 - 001466	e_mai	
CUSTOMER Ph#	(505) 205-4946	X_Link:	..\2017\170830 - 001466 - 10500 Taurus Ct NW		

Complaint: Motor oil in the street & sidewalk coming from address

in_gi ☑

Suspected_Facility	HOME	Type_of_Complaint	OIL

Inspection_Date	8/31/2017	Numberof_FieldVisits	1	Inspector:	GS
Facility_Contact	RESIDENT	Facility Ph. #			

Field_Observatio: there were a lot of oil spots on the driveway.

INITIAL ACTION: Inspector, Gary Sandoval inspected this location and asked the resident to clean up the area. he also distributed pollution prevention brochures at this neighborhood.

Address	9501 SNOW HEIGHTS NE
EVENT_ID	668
REPORTING SOURCE	311
Complaint_Date	8/31/2017
CUSTOMER	ANONYMOUS
311CASE_ID	170831-002196
e_mai	
CUSTOMER Ph#	
X_Link:	..\2017\170831 - 002196 - 9501 Snow Heights NE
Complaint:	Citizens at residence were spilling a chemical in driveway and washing it down with a hose.Citizen is concerned with the chemical smell and it going down into the waste water.
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	HAZARDOUS MATERIAL
Inspection_Date	9/5/2017
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	RESIDENT
Facility Ph. #	
Field_Observatio	no chemicals were visible on the sidewalk.
INITIAL ACTION	the inspector distributed pollution prevention brochures at this neighborhood

Address 10439 TUSCANY CT NW

EVENT_ID 669 **REPORTING SOURCE** 311 **Complaint_Date** 9/1/2017

CUSTOMER JOEY SANTA ANA **311CASE_ID** 170901-001339 **e_mai**

CUSTOMER Ph# X_Link:

Complaint: Citizen was told he need to notify city if draining swimming pool into the gutter. Please callback as soon as can, he is going to planning to it this weekend

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** GREY WATER

Inspection_Date 9/5/2017 **Numberof_FieldVisits** 1 **Inspector:** BL

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio no inspection

INITIAL ACTION inspector called this person and left instruction for him.

Address	1721 HOFFMAN NE				
EVENT_ID	670	REPORTING SOURCE	311	Complaint_Date	9/8/2017
CUSTOMER	STEVE RADIGAN	311CASE_ID	170908-000184	e_mai	radigan.steven@gmail.com
CUSTOMER Ph#	(505) 298-6088	X_Link:	..\2017\170908 - 000184 - 1721 Hoffman NE		
Complaint:	Green yellow color liquid waste being dumped in the drians in front of address. This is not the first time owner of address has dumped down the drains.				
in_gi	☑				
Suspected_Facility	HOME	Type_of_Complaint	HAZARDOUS MATERIAL		
Inspection_Date	9/8/2017	Numberof_FieldVisits	1	Inspector:	GS
Facility_Contact	RESIDENT	Facility Ph. #			
Field_Observatio	there was a lot of stain on along the gutter				
INITIAL ACTION	the inspector asked the resident to clean up the area. He also distributed pollution prevention brochures at this neighborhood.				

Address	1521 ATRISCO NW
EVENT_ID	660
REPORTING SOURCE	311
Complaint_Date	3/23/2017
CUSTOMER	RUSSELL JONES
311CASE_ID	170323-001191
e_mai	rjones@cabq.gov
CUSTOMER Ph#	(505) 242-2677
X_Link:	..\2017\170323-001191-1521 atrisco nw
Complaint:	Per APD, Dumping used motor oil into the soil, southeast corner of the residential property
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	OIL
Inspection_Date	9/12/2017
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	RESIDENT
Facility Ph. #	na
Field_Observatio	no access to backyard
INITIAL ACTION	the resident denied the claim. pollution prevention brochures has been distributed at this neighborhood

Address 5521 CARRICK NW

EVENT_ID 671 **REPORTING SOURCE** 311 **Complaint_Date** 9/11/2017

CUSTOMER NICOLE PACHL **311CASE_ID** 170911-002557 **e_mai**

CUSTOMER Ph# (505) 508-8953 X_Link: ..\2017\170911 - 002557 - 5521 Carrcik NW

Complaint: Oil and gasoline leaking from car in front of address. It is going into the gutter

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** OIL

Inspection_Date 9/12/2017 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio there was a car parked at this address leaking oil and the spots were covered by absorbent.

INITIAL ACTION nobody answered the door. Distributed pollution prevention at this neighborhood.

Address	KRIM AND JEMEZ NE				
EVENT_ID	672	REPORTING SOURCE	EMAIL	Complaint_Date	9/14/2017
CUSTOMER	SARAH HOLCOMB	311CASE_ID	NA	e_mai	sarah.holcomb@state.nm.us
CUSTOMER Ph#	505-827-2798	X_Link:	..\2017\170914 - nmed- email-Krim and Jemez		

Complaint: I received this notification today of a carpet cleaning operation dumping their wastewater into an arroyo. The company name is denoted on the side of the van. The major cross-streets in this area are Paseo del Norte and Wyoming, so I'm guessing it might have been North Domingo Baca. Please keep me in the loop with the follow-up on this. Thank you!

in_gi ☑

Suspected_Facility	THOROCLEAN	Type_of_Complaint	CARPET CLEANING
Inspection_Date	9/14/2017	Numberof_FieldVisits	1
Inspector:	BL		
Facility_Contact	MANAGER	Facility Ph. #	

Field_Observatio: there was residues indicating the dump

INITIAL ACTION: the inspector spoke to the owner of the businessand asked them to stop dumping any waste water in the future.

Address 2100 JOHN SE

EVENT_ID 673 **REPORTING SOURCE** 311 **Complaint_Date** 9/18/2017

CUSTOMER **311CASE_ID** 170918-001041 **e_mai**

CUSTOMER Ph# X_Link: ..\2017\170918 - 001041 - 2100 John St SE

Complaint: Abadoned vehicle leaking fluids into street

in_gi ☑

Suspected_Facility UNKNOWN **Type_of_Complaint** OIL

Inspection_Date 9/19/2017 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact NA **Facility Ph. #**

Field_Observatio there was an abadoned vehicle leaking fluids at this address.

INITIAL ACTION the inspector distributed pollution prevention brochures a this neighborhood.

Address	1415 EDITH SE
EVENT_ID	675
REPORTING SOURCE	311
Complaint_Date	9/18/2017
CUSTOMER	ANONYMOUS
311CASE_ID	170918-001989
e_mai	
CUSTOMER Ph#	
X_Link:	..\2017\170918-001989 1415 Edith
Complaint:	Oil dripping from an abandoned vehicle in front of address
in_gi	☑
Suspected_Facility	UNKNOWN
Type_of_Complaint	OIL
Inspection_Date	9/19/2017
Numberof_FieldVisits	1
Inspector:	jm
Facility_Contact	NA
Facility Ph. #	
Field_Observatio	there was an abandoned vehicle in front of this address. The oil was dried up
INITIAL ACTION	inspector distributed pollution prevention brochours at this neighborhood

Address 12101 PRINCESS JEANNE NE

EVENT_ID 674 **REPORTING SOURCE** 311 **Complaint_Date** 9/18/2017

CUSTOMER KIMBERLY CRYCHO **311CASE_ID** 170918-001788 **e_mai**

CUSTOMER Ph# (505) 275-6124 X_Link: ..\2017\170918 - 001788 - 12101 Princess Jean NE

Complaint: Citizen says that one a week a land scarper 'Mulagins' is washing chemicals in the gutter that go SW toward Paisano NW leaving a stench pool

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 9/21/2017 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio there were several yellow stain on the ground.resident said that he spilled the dye by accident and it is harmless chemical and it is applied with weed killer.

INITIAL ACTION The inspector distributed pollution prevention brochures at this neighborhood.Gary Sandoval

Address 2110 MERRITT SW

EVENT_ID 676 **REPORTING SOURCE** 311 **Complaint_Date** 9/19/2017

CUSTOMER DAVID NEWCOMB **311CASE_ID** 170919-000265 **e_mai**

CUSTOMER Ph# (505) 764-8023 X_Link: ..\2017\170919 - 000265 - 2110 Merritt sw

Complaint: White powdery substance dumped in the gutter in front of address, caller feels it is hazardous. In front of this address and the neighbors property to the east and west of address.

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** PAINT

Inspection_Date 9/25/2017 **Numberof_FieldVisits** 1 **Inspector:** ac

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio there were white dry residue along the gutter and street coming from this address

INITIAL ACTION no one answered the door. Distributed pollution prevention brochures at this neighborhood.

Address 5308 KNIGHT RD NE

EVENT_ID 677 **REPORTING SOURCE** 311 **Complaint_Date** 9/21/2017

CUSTOMER CHARLENE LEAMONS **311CASE_ID** 170921-002648 **e_mai** mistybill_1@q.com

CUSTOMER Ph# (505) 822-8315 X_Link: ..\2017\170921 - 002648 - 5308 Knight ne

Complaint: some one had trouble with either vehicle and spilled Anti-freeze on the street

in_gi ☑

Suspected_Facility UNKNOWN VEHICLE **Type_of_Complaint** OIL & ANTIFREEZE

Inspection_Date 9/26/2017 **Numberof_FieldVisits** 1 **Inspector:** ac

Facility_Contact NA **Facility Ph. #**

Field_Observatio there was a big oil spot at this location

INITIAL ACTION we covered the spot with absorbent and distributed pollution prevention at this neighborhood.

Address 8711 CHAMBERS PL NE

EVENT_ID 661 **REPORTING SOURCE** 311 **Complaint_Date** 3/10/2017

CUSTOMER ANONYMOUS **311CASE_ID** 170310-001920 **e_mai**

CUSTOMER Ph# X_Link: ..\2017\170310 - 001920 - 8711 Chambers NE

Complaint: There are oil puddles in the front yard from used motor oil.

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** OIL

Inspection_Date 9/27/2017 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact NA **Facility Ph. #**

Field_Observatio there was a lot of oil on the driveway but nobody answered the door.

INITIAL ACTION pollution prevention brochures distributed at this neighborhoods

Address 7700 WINTER NE

EVENT_ID 662 **REPORTING SOURCE** 311 **Complaint_Date** 5/26/2017

CUSTOMER ANONYMOUS **311CASE_ID** 170526-001464 **e_mai**

CUSTOMER Ph# X_Link: ..\2017\170526-001464 7700 Winter Ave

Complaint: Citizen said the owner is spraying some type of material on an engine of a car in his driveway and causing it to run down the street.Citizen said asphalt and concrete are turning yellow.

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 9/27/2017 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact **Facility Ph. #**

Field_Observatio the resident was working on several vehicles on his driveway and admitted spraying chemicals on the engin.

INITIAL ACTION the inspector asked him to stop be more careful in using chemicals and he distributed pollution prevention brochures at this neighborhood.

Address	ALLEY BEHIND 1558 EUBANK NE
EVENT_ID	678
REPORTING SOURCE	E-MAIL
Complaint_Date	9/25/2017
CUSTOMER	KEVIN DAGGETT
311CASE_ID	NA
e_mai	
CUSTOMER Ph#	768-2778
X_Link:	..\2017\170925-email-kd-1558 eubank ne
Complaint:	I got a call from ABCWUA about a private SSO at this location.
in_gi	☑
Suspected_Facility	BUSINESS
Type_of_Complaint	SEWAGE
Inspection_Date	9/27/2017
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	MANAGER
Facility Ph. #	
Field_Observatio	private sanitary sewer check out valve overflowed in the alley behind this address. Apparently hasn't reached any inlets and is mostly localized to the property and the alley.
INITIAL ACTION	inspecter spoke to the managers and asked them to fix the problem.he also distributed pollution prevention brochoures at this neighborhood.

Address	1709 SILVER SKY SW
EVENT_ID	663
REPORTING SOURCE	311
Complaint_Date	6/17/2017
CUSTOMER	SEECLICKFIX
311CASE_ID	170612-000870
e_mai	
CUSTOMER Ph#	
X_Link:	..\2017\170612 - 000870 - 1709-1715 Silver Sky SW

Complaint: without going into the street where there is oil dumped. (One car is parked blocking half the street). This is not good for my Service Dog feet. I try to clean her the best I can before she licks at the oil. On my afternoon walks there are just as many cars on the sidewalks everyday but now the kids are in the streets also because the sidewalks are blocked by cars. As fast as cars drive through here it's only a matter of time before someone is hurt or killed. I watched a good neighbor try to speak to a bad one yesterday to clean up his oil spill in the street but the trashy neighbor told him not his problem since it was on the city street now. He knew nothing about the EPA regulations. Please investigate this whole subdivision. We've called APD, spoke to the neighbors and 311 30+ times. Next will be the news. Image: https://seeclickfix.com/files/issue_images/0079/3108/1497094116660.jpg Reported by: An anonymous SeeClickFix user >anonymous@seeclickfix.com< SCF source: http://seeclickfix.com/issues/3482509

in_gi ☑

Suspected_Facility	HOMES
Type_of_Complaint	OIL
Inspection_Date	9/28/2017
Numberof_FieldVisits	1
Inspector:	gs
Facility_Contact	NA
Facility Ph. #	
Field_Observatio	unable to see any major oil spots at this location
INITIAL ACTION	distributed pollution prevention brochures at this neighborhood

Address	628 ESCAVADA SW
EVENT_ID	666
REPORTING SOURCE	311
Complaint_Date	6/2/2017
CUSTOMER	FRANK PADILLA
311CASE_ID	170602-001513
e_mai	
CUSTOMER Ph#	(505) 589-9125
X_Link:	..\2017\170602-001513 -628 Escavada st sw
Complaint:	Vehicle oil leaking from a truck for years, underneath where the truck will be. Supervisor call back requested.
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	OIL
Inspection_Date	10/2/2017
Numberof_FieldVisits	1
Inspector:	AC
Facility_Contact	RESIDENT
Facility Ph. #	na
Field_Observatio	large amount of oil spots covered with dirt were visible under a big truck at this location.
INITIAL ACTION	the resident did not abswer the door. Inspector distributed pollution prevention brochoures at this neighborhood.

Address: HAHN ARROYO AT AZTEC AND PENNSYLVANIA

EVENT_ID: 667 | REPORTING SOURCE: 311 | Complaint_Date: 7/8/2017

CUSTOMER: SEECLICKFIX | 311CASE_ID: 170708-000194 | e_mai:

CUSTOMER Ph#: | X_Link: ..\2017\170708-000194 Paseo del Nordeste Recreation Trail

Complaint: Smelly water running into Hahn Arroyo.

in_gi ☑

Suspected_Facility: ARROYO OUTFALL | Type_of_Complaint: SEWAGE

Inspection_Date: 10/2/2017 | Numberof_FieldVisits: 1 | Inspector: ac

Facility_Contact: NA | Facility Ph. #:

Field_Observatio: there was a trickling clean water running out of the pipe, no odor.

INITIAL ACTION: the inspector checked some of the MHs on Aztec and Pennsylvania and they were dry. It is possible that the caller saw well washing water running through the pipe.

Address	DUKE CITY CAGES AT 900 1ST ST.

EVENT_ID	679	**REPORTING SOURCE**	PH CALL	**Complaint_Date**	10/2/2017
CUSTOMER	SHAHAB BIAZAR	**311CASE_ID**	NA	**e_mai**	
CUSTOMER Ph#	924-3864	X_Link:	..\2017\171002 - 900 1st St. Duke City Cages		

Complaint: the business at this location spreading some kind of black material in the air.

in_gi ☑

Suspected_Facility	DUKE CITY CAGES	**Type_of_Complaint**	HAZARDOUS MATERIAL

Inspection_Date	10/4/2017	**Numberof_FieldVisits**	1	**Inspector:**	BL
Facility_Contact	MANAGER	**Facility Ph. #**			

Field_Observatio this business is replacing their old green artificial turf, and the black material was remaining of the old turf.

INITIAL ACTION the inspector asked them to clean up the area and be careful how they remove the old turf not to spray the black particles in the air. He also distributed pollution prevention brochures at this ares.

Address | 4100 CENTRAL SE

EVENT_ID | 684 | REPORTING SOURCE | EMAIL | Complaint_Date | 10/4/2017

CUSTOMER | PAULA DODGE-KWAN | 311CASE_ID | NA | e_mai | pdodge-kwan@cabq.gov

CUSTOMER Ph# | 768-3623 | X_Link: | ..\2017\171004 - 4100 Central SE - CGP Complaint

Complaint: mud 0n the street

in_gi ☑

Suspected_Facility | BUSINESS | Type_of_Complaint | CONSTRUCTION

Inspection_Date | 10/5/2017 | Numberof_FieldVisits | 1 | Inspector: | GS

Facility_Contact | SUPERINTENDENT | Facility Ph. # | na

Field_Observatio | there were mud on the street coming from this construction site.this site is 0.8 acre and does not require SWPPP.

INITIAL ACTION | inspector asked the Superintendent to clean up the site.

Address	9139 SANTA CATALINA NW				
EVENT_ID	680	**REPORTING SOURCE**	311	**Complaint_Date**	10/10/2017
CUSTOMER	ANONYMOUS	**311CASE_ID**	171010-002744	**e_mai**	na
CUSTOMER Ph#	na	X_Link:	..\2017\171010-002744 - 9139 Santa Catalina NW		
Complaint:	Car parking in front of address is leaking lots of oil.				
in_gi	☑				
Suspected_Facility	HOME	**Type_of_Complaint**	OIL		
Inspection_Date	10/16/2017	**Numberof_FieldVisits**	1	**Inspector:**	GS
Facility_Contact	RESIDENT	**Facility Ph. #**	na		
Field_Observatio	there were siveral big oil spots at this location				
INITIAL ACTION	the inspector covered the oil spots with absorbent and distributed pollution prevention brochures at this neighborhood.				

Address	1400 SAN MATEO SE

EVENT_ID	681	**REPORTING SOURCE**	311	**Complaint_Date**	10/9/2017
CUSTOMER	PATRICK PAIZ	**311CASE_ID**	171009-000659	**e_mai**	na
CUSTOMER Ph#	(505) 315-7528	X_Link:	..\2017\171009-000659 1400 san mateo se		

Complaint: owner often dump feces, concrete, and drywall down the easements drains.

in_gi ☑

Suspected_Facility	BUSINESS	**Type_of_Complaint**	TRASH
Inspection_Date	10/18/2017	**Numberof_FieldVisits**	1
Inspector:	AC		
Facility_Contact	OWNER OF THE BUSINESS	**Facility Ph. #**	na

Field_Observatio there were no evidence of any debris in the easement.

INITIAL ACTION the inspector told the owner to keep the area clean and distributed pollution prevention brochures at this area

Address 2318 GARFIELD SE

EVENT_ID 683 **REPORTING SOURCE** HOT LINE **Complaint_Date** 10/20/2017

CUSTOMER ANONYMOUS **311CASE_ID** NA **e_mai** na

CUSTOMER Ph# 506-2190 X_Link: ..\2017\171020-2318 garfield se

Complaint: dumping oil into the storm inlets

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** OIL

Inspection_Date 10/25/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact RESIDENT **Facility Ph. #** na

Field_Observatio inspector found two inlets with minor oil stain around it

INITIAL ACTION inspector distributed pollution prevenrion brochures at this neighborhood.

Address 47TH AND CENTRAL NW

EVENT_ID 682 **REPORTING SOURCE** 311 **Complaint_Date** 10/24/2017

CUSTOMER ANONYMOUS **311CASE_ID** 171024-001802 **e_mai**

CUSTOMER Ph# na X_Link: ..\2017\171024-001802-central-47th nw

Complaint: Motor oil dumped on the sidewalk, northisde of Central west of 47th. Shopping is full oil as well.

in_gi ☑

Suspected_Facility BUSINESS **Type_of_Complaint** OIL

Inspection_Date 10/25/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact MANAGER **Facility Ph. #** na

Field_Observatio there was a small oil spot at this corner

INITIAL ACTION inspector covered the oil spot with absorbent and distributed pollution prevention brochures at this area.

Address LAST CALL RESTAURANT AT 102 RICHMOND NE

EVENT_ID 685 **REPORTING SOURCE** EMAIL **Complaint_Date** 10/26/2017

CUSTOMER MELISSA LOZOYA **311CASE_ID** NA **e_mai** mlozoya@cabq.gov

CUSTOMER Ph# 768-3661 X_Link: ..\2017\171026-email- 102 richmond ne-alley at central and monte vista

Complaint: the alley behind this address is full of cooking grease.

in_gi ☑

Suspected_Facility LAST CALL RESTAURANT **Type_of_Complaint** COOKING GREASE

Inspection_Date 10/26/2017 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact MANAGER **Facility Ph. #** 510-206-6076

Field_Observatio there were several cooking oil spill in the alley near the dumpester. Also a 55 gallon tank of used cooking oil was next to dumpester

INITIAL ACTION the inspector spoke to the manager and asked them to clean up the alley. also environmental health inspector asked them to do so.

Address	1ST AND ASPEN NW				
EVENT_ID	686	REPORTING SOURCE	311	Complaint_Date	10/11/2017
CUSTOMER	JOE CALKINS	311CASE_ID	171011-002229	e_mai	
CUSTOMER Ph#	(505) 318-4301	X_Link:	..\2017\171011-002229 -1st and aspen nw		
Complaint:	2 quarts of oil spilled in street.				
in_gi	☑				
Suspected_Facility	UNKNOWN	Type_of_Complaint	OIL		
Inspection_Date	10/31/2017	Numberof_FieldVisits	1	Inspector:	JM
Facility_Contact	NA	Facility Ph. #	na		
Field_Observatio	there was a large oil spill on the street				
INITIAL ACTION	the inspector covered the oil spill and distributed pollution prevention at this area				

Address	MACKLAND & LAFAYETTE
EVENT_ID	687
REPORTING SOURCE	311
Complaint_Date	10/27/2017
CUSTOMER	BIANCA PRUMO
311CASE_ID	171027-001508
e_mai	biancaprumo@gmail.com
CUSTOMER Ph#	(505) 228-5759
X_Link:	..\2017\171027-001508 Mackland and Lafayette
Complaint:	Albuquerque Asphalt dumping none potable water into gutters
in_gi	☑
Suspected_Facility	ALBUQUERQUE ASPHALT
Type_of_Complaint	CONSTRUCTION
Inspection_Date	11/2/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	INSPECTOR
Facility Ph. #	na
Field_Observatio	No evidence of water being poured into SW inlets
INITIAL ACTION	Inspector spoke with Albuquerque Asphalt workers on the site and explained the Ordanance.

Address 58TH AND 59TH AND CENTRAL

EVENT_ID 690 **REPORTING SOURCE** EMAIL **Complaint_Date** 11/7/2017

CUSTOMER PAULA DODGE-KWAN **311CASE_ID** NA **e_mai** pdodge-kwan@cabq.gov

CUSTOMER Ph# 768-3623 X_Link: ..\2017\171107-email-59th & Central

Complaint: Can you send an inspector out to check the work that AUI is doing at 58th and 59th and Central. They are tracking out in to the street.

in_gi ☑

Suspected_Facility AUI **Type_of_Complaint** CONSTRUCTION

Inspection_Date 11/7/2017 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact SUPERINTENDENT **Facility Ph. #**

Field_Observatio Inspector found several SWPPP violations, such as silt fence, wash out area, and exit ramp

INITIAL ACTION superintendent promised to fix all the violations.

Address 306 SAN PEDRO SE

EVENT_ID 688 **REPORTING SOURCE** 311 **Complaint_Date** 11/3/2017

CUSTOMER ANONYMOUS **311CASE_ID** 171103-000493 **e_mai** na

CUSTOMER Ph# X_Link: ..\2017\171103-000493 306 San Pedro

Complaint: Water full of chemicals/oil being dumped down a closed business drain. Lions auto detail shop. Dumping into laundry mat next door that is closed.

in_gi ☑

Suspected_Facility LIONS AUTO DETAIL SHOP **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 11/9/2017 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact MANAGER **Facility Ph. #** 315-6716

Field_Observatio they were dumping into a sanitary line .

INITIAL ACTION inspector distributed pollution prevention brochoures at this complex.

Address	12012 PALM SPRINGS AVE NE
EVENT_ID	689
REPORTING SOURCE	311
Complaint_Date	11/16/2017
CUSTOMER	SEECLICKFIX
311CASE_ID	171116-002316
e_mai	na
CUSTOMER Ph#	na
X_Link:	..\2017\171116-002316-Clean Carpet Care
Complaint:	carpet company dumping cleaning waste water into storm drain. phone #292-1611. See picture Image: https://seeclickfix.com/files/issue_images/0091/6360/img-90741623411188.jpg Reported by: Joe Dierte >bjw204@msn.com< SCF source: http://seeclickfix.com/issues/3883841
in_gi	☑
Suspected_Facility	CLEAN CARPET CARE
Type_of_Complaint	CARPET CLEANING
Inspection_Date	11/21/2017
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	OWNER
Facility Ph. #	292-1611
Field_Observatio	no address to go to
INITIAL ACTION	Inspector met with the owner of business (Mr. DiBruno) and informed him that the action of dumping his company's waste water into the storm drain was illegal and could result in heavy fines if they did it again. I gave him a pollution prevention brochure. He said that he knew it was illegal and will speak to the employee who did it and it won't happen again.

Address	7821 EAGLE ROCK AVE NE
EVENT_ID	691
REPORTING SOURCE	EMAIL
Complaint_Date	11/22/2017
CUSTOMER	KEVIN D
311CASE_ID	NA
e_mai	
CUSTOMER Ph#	
X_Link:	..\2017\171122-7821 Eagle Rock Ave NE
Complaint:	blowing leaves into storm inlet
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	LEAVES
Inspection_Date	11/22/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	RESIDENT
Facility Ph. #	na
Field_Observatio	home owner stated that he did blow a small percentage of his leaves into the street, but for the most part bagged and disposed if the majority of his leaves. There was no storm inlets on this street.
INITIAL ACTION	Inspector explained the COA Ordinance and left him with our brochure. He stated that he would refrain from blowing his leaves into the street.

Address	3221 CANDLELIGHT NE
EVENT_ID	695
REPORTING SOURCE	311
Complaint_Date	11/20/2017
CUSTOMER	CHRIS KING
311CASE_ID	171120-000864
e_mai	
CUSTOMER Ph#	450-6592
X_Link:	..\2017\171120-000864 3221 Candlelight NE
Complaint:	Neighbor has a roll off dumpster on his property and citizen wants to how long he is able to keep it there
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	CONSTRUCTION
Inspection_Date	11/27/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	NA
Facility Ph. #	na
Field_Observatio	inspector GS did not find any dumpster on the site.
INITIAL ACTION	no action required

Address	915 PALISADES NW				
EVENT_ID	692	REPORTING SOURCE	311	Complaint_Date	11/29/2017
CUSTOMER	APD	311CASE_ID	171129-000102	e_mai	
CUSTOMER Ph#	242-2677	X_Link:	..\2017\171129-000102 915 Palisades		

Complaint: APD OPERATOR #2064 CAD #P173321029APD REPORTED ILLEGAL DUMPING IN STORM DRAIN.

in_gi ☑

Suspected_Facility	HOME	Type_of_Complaint	SEWAGE
Inspection_Date	11/29/2017	Numberof_FieldVisits	1
Inspector:	GS		
Facility_Contact	OWNER	Facility Ph. #	na

Field_Observatio: homeowner stated that they were discharging urin from RV

INITIAL ACTION: the inspector discussed the COA Ordinance, gave a brochure and glued a "Don't pollute" sticker on the storm drain. The home owner stated that the illicit discharge would immediately stop.

Address	2111 BROADWAY NE
EVENT_ID	693
REPORTING SOURCE	WEB
Complaint_Date	11/28/2017
CUSTOMER	LOUIE GUTIERRZ
311CASE_ID	NA
e_mai	louibruening@rocketmail.com
CUSTOMER Ph#	401-9116
X_Link:	..\2017\171203 - 2111 Broadway NE
Complaint:	next door neighbor is dumping trash in the empty lot by my house and I-4-
in_gi	☑
Suspected_Facility	HOMES
Type_of_Complaint	TRASH
Inspection_Date	12/5/2017
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	RESIDENT
Facility Ph. #	na
Field_Observatio	there is evidence of debris being dumped onto the vacant lot.
INITIAL ACTION	forwarded this case to NMDOT because this lot is their property

Address 1208 INDIANA ST NE

EVENT_ID 694 **REPORTING SOURCE** 311 **Complaint_Date** 12/16/2017

CUSTOMER LARRY LESHIN **311CASE_ID** 171216-001379 **e_mai**

CUSTOMER Ph# 266-2383 X_Link: ..\2017\171216-001379 - 1208 Indiana ST NE

Complaint: Citizen stated there is an RV or a trailer with somone living in it at site address. He witnessed them dumping the sewage in the yard and it ran down the street into ctizens yard storm drain.

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** SEWAGE

Inspection_Date 12/19/2017 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact RESIDENT **Facility Ph. #** na

Field_Observatio inspector Gary Sandoval spoke with the home owner, he told the inspector that his sanitary line plugged up causing the overflow from the clean out valve.

INITIAL ACTION the resident did clean up the sewage. The inspector distributed pollution prevention brochures at this neighborhood.

Address	CONSTITUTION BETWEEN ALVARADO AND PALOMAS NE-ALLEY

EVENT_ID	696	REPORTING SOURCE	311	Complaint_Date	12/18/2017
CUSTOMER	DARCY BUSHNELL	311CASE_ID	171218-000995	e_mai	dmc793@gmail.com
CUSTOMER Ph#	(505) 379-5335	X_Link:	..\2017\171218-000995 Complaint of possibly waste dumped in alley		

Complaint: There are nearly bottles dumped in alley with brown and yellow liquid in alley. Citizen says the liquid smells bad. Citizen thinks this liquid may be hazardous.

in_gi ☑

Suspected_Facility	ALLEY	Type_of_Complaint	HAZARDOUS MATERIAL
Inspection_Date	12/21/2017	Numberof_FieldVisits	1
Inspector:	GS		
Facility_Contact	NA	Facility Ph. #	na

Field_Observatio: there were several piles of bottles with brown and yellow liquid in them.

INITIAL ACTION: Jake Daugherty of solid waste Spoke with Kathy Verhage in DMD. She provided a POR number for the ACT Biohazard contract and gave me authorization to have ACT pick up the material. I sent ACT an authorization an instructed them to contact the customer and have the material removed by 12/19/17.the cost of cleaning was $4242.

Address I-40 NEAR CRIMSON, NW

EVENT_ID 697 **REPORTING SOURCE** 311 **Complaint_Date** 11/16/2017

CUSTOMER SEECLICKFIX **311CASE_ID** 171116-002290 **e_mai**

CUSTOMER Ph# X_Link: ..\2017\171116-002290 - I40 & Crimson

Complaint: A Vac truck (WD 104692) dumping sewage into the arroyo.The name on the truck is Southwest Sewer Service.Today Nov. 16, 2017 around 1pm.They were parked on the bike trail in a low spot where it crosses the arroyo. Multi-use trial north side of I-40 near Crimson Ave, NW. They had the Vac truck hoses on the ground dumping into the arroyo. SeeClickFix user http://seeclickfix.com/issues/3883829

in_gi ☑

Suspected_Facility ARROYO **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 1/4/2018 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact SOUTHWEST SEWER SERVICE **Facility Ph. #** 269-6358

Field_Observatio Southwest sewer services was doing some clean up work for AMAFCA. The dump was into AMAFCA pond by their permission.It was not sanitary waste.

INITIAL ACTION no action

Address	1404 VILLA LILA NE
EVENT_ID	698
REPORTING SOURCE	
Complaint_Date	1/3/2018
CUSTOMER	ANONYMOUS
311CASE_ID	180103-001745
e_mai	
CUSTOMER Ph#	
X_Link:	..\2018\180103-001745-1404 VILLA LILA NE
Complaint:	Green 4 door hatchback Chevy Mailbu is leaking oil and gas on the street.
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	OIL
Inspection_Date	1/4/2018
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	RESIDENT
Facility Ph. #	na
Field_Observatio	there were several oil spots at this location
INITIAL ACTION	nspector Justin Muniz covered the oil spots with absorbent and distributed pollution prevention brochures at this neighborhood.

Address	RIO GRANDE BLVD & NEW YORK
EVENT_ID	699
REPORTING SOURCE	311
Complaint_Date	1/10/2018
CUSTOMER	DAVID MEDINA
311CASE_ID	180110-000246
e_mai	davidmedina61@yahoo.com
CUSTOMER Ph#	(505) 203-3533
X_Link:	..\2018\180110-000246 - Rio Grande & New York
Complaint:	Citizen witnessed Kelly Cable pouring concrete slab & rinsing concrete remains down the inlet drain.
in_gi	☑
Suspected_Facility	KELLY CABLE
Type_of_Complaint	CONSTRUCTION
Inspection_Date	1/11/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	JAMES RICHARDSON
Facility Ph. #	280-4383
Field_Observatio	the dry residue of cement washing was visible along the gutter.
INITIAL ACTION	the supervisor informed the crew not to wash cement into storm drains.

Address	PETER HURD AND WILLIAM MOYERS NE

EVENT_ID	700	REPORTING SOURCE	311	Complaint_Date	1/22/2018
CUSTOMER	ANONYMOUS	311CASE_ID	180122-002433	e_mai	na
CUSTOMER Ph#	na	X_Link:	..\2018\180122-002433 - Pete Hurd St.& William Moyers Ave		

Complaint: Waste water from carpet cleaning is being dumped into gutter-Citizen did not know exact address. The name of the companing is Avalanche Cleaning and there is van parked at house

in_gi ☑

Suspected_Facility	AVALANCHE CLEANING	Type_of_Complaint	CARPET CLEANING
Inspection_Date	1/24/2018	Numberof_FieldVisits	1
Inspector:	GS		
Facility_Contact	OWNER	Facility Ph. #	897-4408

Field_Observatio: inspector Gary Sandoval spoke with the owner and he said that he empty the waste water in to sanitary clean out , not to the gutter.

INITIAL ACTION: inspector informed the owner about the city storm ordinance and distributed pollution prevention brochoures at this neighborhood.

Address	1102 MOUNTAIN NW AND 821 FORRESTER NW
EVENT_ID	701
REPORTING SOURCE	E-MAIL
Complaint_Date	2/6/2018
CUSTOMER	JIM MCCORMICK
311CASE_ID	NA
e_mai	smsanchez@cabq.gov
CUSTOMER Ph#	670-4523
X_Link:	..\2018\180206 Mountain @ Forrester foul smell
Complaint:	I just got a call from the business owner of this property, Jim McCormick. He claims that there is a very foul smell coming from his storm drain. He is hoping to get a remedy to this.
in_gi	☑
Suspected_Facility	STORM DRAIN
Type_of_Complaint	SEWAGE
Inspection_Date	2/8/2018
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	NA
Facility Ph. #	na
Field_Observatio	a video inspection of the storm line indicated a sanitary line connection to the storm line at 1102 Mountain nw
INITIAL ACTION	the owner of the building corrected the connection, the cost was $3900.

Address 8515 WINTER SAGE SW

EVENT_ID 702 REPORTING SOURCE 311 Complaint_Date 2/9/2018

CUSTOMER ANONYMOUS 311CASE_ID 180209-000467 e_mai na

CUSTOMER Ph# X_Link: ..\2018\180209-000467 - 8515 Winter Sage SW

Complaint: Motor oil in the driveway

in_gi ☑

Suspected_Facility HOMW Type_of_Complaint OIL

Inspection_Date 2/9/2018 Numberof_FieldVisits 1 Inspector: gs

Facility_Contact RESIDENT Facility Ph. # na

Field_Observatio there were several oil spots on their private driving pad.no body was at home.

INITIAL ACTION inspector Gary Sandoval distributed pollution prevention brochures at this neighborhood

Address SOUTHERN AND BUENA VISTA NE

EVENT_ID 703 **REPORTING SOURCE** 311 **Complaint_Date** 2/14/2018

CUSTOMER COLETTE BRISTOL **311CASE_ID** 180214-002180 **e_mai** colettebristol@aol.com

CUSTOMER Ph# 845-9561 X_Link: ..\2018\180214-002180 Southern NE @ Buena Vista

Complaint: Request for Poop Fairy signs along Southern and Buena vista.

in_gi ☑

Suspected_Facility STREET **Type_of_Complaint** DOG POOPS

Inspection_Date 2/20/2018 **Numberof_FieldVisits** 1 **Inspector:** BL

Facility_Contact NA **Facility Ph. #** na

Field_Observatio na

INITIAL ACTION posted two signs at this area

Address 1419 COAL AVE SW

EVENT_ID 704 **REPORTING SOURCE** E-MAIL **Complaint_Date** 2/17/2018

CUSTOMER JULIE SILVERMAN **311CASE_ID** NA **e_mai** julie.silverman@comcast.net

CUSTOMER Ph# 269-6632 X_Link: ..\2018\180220 Coal and 14th Poop Fairy Signs

Complaint: I would like to purchase 4 signs please. They are great! Saw them on north Louisiana median. My son needs them in his yard across from KOB on Coal!

in_gi ☑

Suspected_Facility STREET **Type_of_Complaint** DOG POOPS

Inspection_Date 2/21/2018 **Numberof_FieldVisits** 1 **Inspector:** BL

Facility_Contact NA **Facility Ph. #** na

Field_Observatio na

INITIAL ACTION the signes delivered and also posted at this address.

Address	10213 CHAPALA PL NE
EVENT_ID	705
REPORTING SOURCE	311
Complaint_Date	3/4/2018
CUSTOMER	ANONYMOUS
311CASE_ID	180103-001745
e_mai	na
CUSTOMER Ph#	na
X_Link:	..\2018\180103-001745-1404 VILLA LILA NE
Complaint:	Radiator fluid. Homeowner flushes her radiator fluid into the storm drain from her Dodge Ram with a red stripe and the numbers 1-877-485-9740. She has done this several times. The sidewalk is discolored an orange color from her doing this due to it draining from her truck into the storm drain.
in_gi	✔
Suspected_Facility	HOME
Type_of_Complaint	OIL & ANTIFREEZE
Inspection_Date	3/5/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	RESIDENT
Facility Ph. #	
Field_Observatio	there were several yellow stained spots on the drive way at this location.
INITIAL ACTION	inspector Gary Sandoval distributed pollution prevention brochures at this neighborhood.

Address LAFAYETTE PARK AT 3509 LAFAYETTE NE

EVENT_ID 706 **REPORTING SOURCE** WEB **Complaint_Date** 3/5/2018

CUSTOMER CHAD HAIRSTON **311CASE_ID** NA **e_mai** thechad505@gmail.com

CUSTOMER Ph# 505-400-2423 X_Link: ..\2018\180306 - Lafayette Park & Channel

Complaint: couch cushions and bed mattress, misc clothing items

in_gi ☑

Suspected_Facility DRAINAGE CHANNEL **Type_of_Complaint** TRASH

Inspection_Date 3/6/2018 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact **Facility Ph. #**

Field_Observatio there were debris in the channel

INITIAL ACTION forwarded the call to arroyo maintenance

Address 4915 GLENWOOD HILLS NE

EVENT_ID 707 **REPORTING SOURCE** 311 **Complaint_Date** 3/6/2018

CUSTOMER ANONYMOUS **311CASE_ID** 180306-002048 **e_mai**

CUSTOMER Ph# na X_Link: ..\2018\180306-002048 4915 Glenwood Hills DR NE

Complaint: Large pool of oil in the street / leaking from vehicle at address

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** OIL

Inspection_Date 3/7/2018 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio there were several oil spots at this location

INITIAL ACTION inspector Justin covered the oil spots with absorbent and asked the resident to sweep it next day. Also he distributed pollution prevention brochures at this neighborhood.

Address	200 GENERAL SOMERVELL NE
EVENT_ID	708
REPORTING SOURCE	WEB
Complaint_Date	3/7/2018
CUSTOMER	RICK
311CASE_ID	NA
e_mai	negra12duke@gmail.com
CUSTOMER Ph#	505-440-1329
X_Link:	..\2018\180307 - Buena Vista & General Somervell
Complaint:	Oil
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	OIL
Inspection_Date	3/8/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	RESIDENT
Facility Ph. #	
Field_Observatio	there were several area covered with oil
INITIAL ACTION	the inspector covered the oil spots with absorbent and distributed pollution prevention brochures at this neighborhood

Address 221 DESCANSO SE

EVENT_ID	709	**REPORTING SOURCE**	PH CALL	**Complaint_Date**	3/15/2018
CUSTOMER	ANONYMOUS	**311CASE_ID**	NA	**e_mai**	na
CUSTOMER Ph#	249-9469	X_Link:	..\2018\180315 - 221 Descanso SE		

Complaint: dumping oil on the sidewalk and street while working on their car

in_gi ☑

Suspected_Facility	HOME	**Type_of_Complaint**	OIL

Inspection_Date	3/15/2018	**Numberof_FieldVisits**	1	**Inspector:**	GS
Facility_Contact	RESIDENT	**Facility Ph. #**			

Field_Observatio no oil spots were visible

INITIAL ACTION distributed pollution prevention brochures at this neighborhood

Address	UNIVERSITY LODGE AT 3711 CENTRAL NE

EVENT_ID	710	REPORTING SOURCE	311	Complaint_Date	3/26/2018
CUSTOMER	ANONYMOUS	311CASE_ID	180326-001210	e_mai	
CUSTOMER Ph#		X_Link:	..\2018\180326-001210 University Lodge		

Complaint: Citizen saw the owner of university lodge dump 4 or 5 wheelbarrows of dirt/gravel into storm drain

in_gi ☑

Suspected_Facility	UNIVERSITY LODGE	Type_of_Complaint	TRASH
Inspection_Date	3/28/2018	Numberof_FieldVisits	1
Inspector:	JM		
Facility_Contact	MANAGER	Facility Ph. #	

Field_Observatio: there was some dirt on top of the inlet.

INITIAL ACTION: Justin Muniz spoke to the manager of the motel and asked to stop dumping any trash inside the storm inlet.

Address	GALLES CAR DELAR AT 1601 LOMAS NE
EVENT_ID	711
REPORTING SOURCE	311
Complaint_Date	3/28/2018
CUSTOMER	DAVID WAGNER
311CASE_ID	180328-002087
e_mai	d.wagner@wt-us.com
CUSTOMER Ph#	823-4488
X_Link:	..\2018\180328-002087 University and Lomas
Complaint:	wants a copy of SWPPP for the project at this address
in_gi	☑
Suspected_Facility	GALLES CHEVROLET
Type_of_Complaint	CONSTRUCTION
Inspection_Date	3/29/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	NA
Facility Ph. #	
Field_Observatio	na
INITIAL ACTION	informed the callewr that city does not have a copy of the swppp.

Address	COMANCHE AND SAN MATEO NE

EVENT_ID	712	REPORTING SOURCE	311	Complaint_Date	4/7/2018
CUSTOMER	ERIN ASKAR	311CASE_ID	180407-000156	e_mai	easkar@gmail.com
CUSTOMER Ph#	(801) 787-4435	X_Link:	..\2018\180407-000156 Storm drain has steam		

Complaint: Storm drain has steam coming out

in_gi ☑

Suspected_Facility	INLETS	Type_of_Complaint	HAZARDOUS MATERIAL

Inspection_Date	4/10/2018	Numberof_FieldVisits	1	Inspector:	JM
Facility_Contact	NA	Facility Ph. #	na		

Field_Observatio: inspector did not find any unusual things related to the storm drain.

INITIAL ACTION: no action

Address 10620 WALNUT CANYON SW

EVENT_ID 713 **REPORTING SOURCE** 311 **Complaint_Date** 4/11/2018

CUSTOMER BLANCA FLORES **311CASE_ID** 180411-000718 **e_mai** b_borunda@hotmail.com

CUSTOMER Ph# (505) 720-7565 X_Link: ..\2018\180411-000718 - 10620 Walnut Canyon SW

Complaint: Oil spills and oil buckets in the front yard

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** OIL

Inspection_Date 4/12/2018 **Numberof_FieldVisits** 1 **Inspector:** GS

Facility_Contact RESIDENT **Facility Ph. #**

Field_Observatio There was no answer at the residence. There were several minor oil spots at this area.

INITIAL ACTION inspector Gary Sandoval distributed pollution prevention brochures at this neighborhood.

Address	4300 EUBANK NE
EVENT_ID	714
REPORTING SOURCE	PH CALL
Complaint_Date	4/16/2018
CUSTOMER	ANONYMOUS
311CASE_ID	NA
e_mai	
CUSTOMER Ph#	
X_Link:	..\2018\180416 - SSO - 4300 Eubank NE
Complaint:	sewage flowing to the street
in_gi	☑
Suspected_Facility	PIZZA-9
Type_of_Complaint	SEWAGE
Inspection_Date	4/16/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	MANAGER
Facility Ph. #	293-6463
Field_Observatio	the pluged sanitary line has been fixed
INITIAL ACTION	no action

Address	EL TACO DEL MEXICO FOOD TRUCK AT 1110 4TH SW
EVENT_ID	715
REPORTING SOURCE	311
Complaint_Date	4/16/2018
CUSTOMER	ANONYMOUS
311CASE_ID	180416-000722
e_mai	na
CUSTOMER Ph#	na
X_Link:	..\2018\180416-000722 1123 4th St SW
Complaint:	The citizen states they have witnessed the employee(s) of the El Taco Del Mexico food truck dumping old cooking oil into the storm drain on the corner of the street there late in the evening.
in_gi	☑
Suspected_Facility	EL TACO DEL MEXICO FOOD TRUCK
Type_of_Complaint	COOKING GREASE
Inspection_Date	4/20/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	LAND LORD
Facility Ph. #	261-2479
Field_Observatio	there is evidence of dumping waste food into the storm drain
INITIAL ACTION	inspector asked the owner to stop dumping any waste into the storm drain in the future. Also gave him some pollution prevention brochures

Address GRUET WINERY AT 8400 PAN AMERICAN FWY NE

EVENT_ID 745 **REPORTING SOURCE** E-MAIL **Complaint_Date** 4/12/2018

CUSTOMER TIM TRUJILLO **311CASE_ID** NA **e_mai** TimothyR.Trujillo@state.nm.us

CUSTOMER Ph# X_Link: ..\2018\180412-gruet winery at 8400 pan american fwy ne-email

Complaint: The effluent smelled of wine and there was some sort of white foamy substance. The concrete is heavily stained and the discharge is eating away at the structure.

in_gi ☑

Suspected_Facility GRUET WINERY **Type_of_Complaint** COLORD LIQUID

Inspection_Date 4/23/2018 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact MANAGER **Facility Ph. #** 821-0055

Field_Observatio there was wine smelly water coming out of the building.

INITIAL ACTION the inspector asked the manager to stop releasing any liquid to the storm drain.in a later inspection, the area was clean and no illicit discharge.

Address	9028 SCHOONER NW				
EVENT_ID	716	**REPORTING SOURCE**	311	**Complaint_Date**	4/21/2018
CUSTOMER	DAVID MARTINEZ	**311CASE_ID**	180421-000910	**e_mai**	davidm0619@hotmail.com
CUSTOMER Ph#	(505) 228-7993	X_Link:	..\2018\180421-000910 Coyote Concrete IDD		

Complaint: The neighbors hired a company called Coyote to do the concrete work.A company by the name of Coyote had cement running down the gutter into the storm drain.

in_gi ☑

Suspected_Facility	COYOTE CONCRETE	**Type_of_Complaint**	CONSTRUCTION		
Inspection_Date	4/26/2018	**Numberof_FieldVisits**	1	**Inspector:**	JM
Facility_Contact	MANAGER	**Facility Ph. #**			

Field_Observatio there were visibil dry cement residue track in the gutter going to storminlet.

INITIAL ACTION the inspector spoke to the manager and he agreed not to repeat it in the future.

Address	BOW & ARROW LODGE AT 8300 CENTRAL AVE				
EVENT_ID	718	**REPORTING SOURCE**	EMAIL	**Complaint_Date**	4/25/2018
CUSTOMER	ANONYMOUS	**311CASE_ID**	NA	**e_mai**	
CUSTOMER Ph#		X_Link:	..\2018\180425 Bow & Arrow Lodge 8300 Central Ave		

sanitary sewer overflow

Complaint:

in_gi ☑

Suspected_Facility	BOW & ARROW LODGE	**Type_of_Complaint**	SEWAGE
Inspection_Date	4/26/2018	**Numberof_FieldVisits**	1
Inspector:			
Facility_Contact		**Facility Ph. #**	

Field_Observatio

INITIAL ACTION

Address	2202 NEW YORK SW
EVENT_ID	719
REPORTING SOURCE	WEB
Complaint_Date	4/26/2018
CUSTOMER	ANONYMOUS
311CASE_ID	NA
e_mai	
CUSTOMER Ph#	
X_Link:	..\2018\180426 - 2202 New York Ave SW Leaves
Complaint:	dumping leaves in the storm inlets
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	LEAVES
Inspection_Date	4/26/2018
Numberof_FieldVisits	1
Inspector:	AG
Facility_Contact	RESIDENT
Facility Ph. #	
Field_Observatio	there were leaves in the inlets.the resident said that the landscaping co did the dump.
INITIAL ACTION	distributed pollution prevention brochures at this neighborhood

Address 1210 GIRARD BLVD NE

EVENT_ID 720 **REPORTING SOURCE** 311 **Complaint_Date** 4/26/2018

CUSTOMER ANONYMOUS **311CASE_ID** 180426-002017 **e_mai**

CUSTOMER Ph# na X_Link: ..\2018\180426-002017 Above the Rest Carpet Cleaning

Complaint: Above The Rest Carpet Cleaning is dumping waste water into storm drain-Truck # 6024991535 phone # is 292-0277 Plate is Arizona plate G40302. Citizen also gave names and numbers for Property Owner and Tenant-Denise at 505-319-8788 and Conrad 505-480-2272. Also,offered transfer to 768-2738. This incident occurred at incident address around 245pm on 04/26/18

in_gi ☑

Suspected_Facility ABOVE THE REST CARPET CLEANING **Type_of_Complaint** CARPET CLEANING

Inspection_Date 4/30/2018 **Numberof_FieldVisits** 1 **Inspector:** AG

Facility_Contact OWNER **Facility Ph. #** 292-0277

Field_Observatio no visit

INITIAL ACTION owner and the employee of this business were informed abot the incident and asked them to stop dumping in the future.

Address	10919 CASCADA AZUL PL NW				
EVENT_ID	721	**REPORTING SOURCE**	311	**Complaint_Date**	4/26/2018
CUSTOMER	DUBRA KARNES-PADILLA	**311CASE_ID**	180426-002125	**e_mai**	dubrakp@gmail.com
CUSTOMER Ph#	(505) 480-7753	X_Link:	..\2018\180426-002125 Request for There is No Poop Fairy		

Complaint: She is requesting that they be delivered.

in_gi ☑

Suspected_Facility	RESIDENT	**Type_of_Complaint**	DOG POOPS
Inspection_Date	4/30/2018	**Numberof_FieldVisits**	1
Inspector:	jm		
Facility_Contact		**Facility Ph. #**	

Field_Observatio

INITIAL ACTION inspector Justin Muniz delivered the requested sign

Address 5333 4TH ST NW

EVENT_ID 717 REPORTING SOURCE 311 Complaint_Date 4/24/2018

CUSTOMER KEVIN DOUVILLE 311CASE_ID 180424-001916 e_mai kjdouville@gmail.com

CUSTOMER Ph# (505) 205-8341 X_Link: ..\2018\180424-001916 Oil is being dumped down the storm drain

Complaint: Restaurant is dumping oil down the storm drain easement at this location.

in_gi ☑

Suspected_Facility RESTAURANT Type_of_Complaint OIL

Inspection_Date 5/1/2018 Numberof_FieldVisits 1 Inspector: JM

Facility_Contact NA Facility Ph. # na

Field_Observatio the restaurant is out of business. There were several oil spots at the entrance.

INITIAL ACTION the oil spots covered with absorbent.

Address	SUNSHINE THEATRE AT 120 CENTRAL SW				
EVENT_ID	724	**REPORTING SOURCE**	E-MAIL	**Complaint_Date**	5/4/2018
CUSTOMER	CAROL PARKER	**311CASE_ID**	EMAIL	**e_mai**	cmparker822@gmail.com
CUSTOMER Ph#		X_Link:	X:\MUNICIPAL DEVELOPMENT\SHARE\MD-Storm\7_NPDES\311_SWQ_		

Complaint: Lunch time, Black gross water being pumped into gutter and then to storm drain

in_gi ☑

Suspected_Facility	BLUE CARPET CLEANERS	**Type_of_Complaint**	CARPET CLEANING
Inspection_Date	5/8/2018	**Numberof_FieldVisits**	1
Inspector:	AG		
Facility_Contact	OWNER	**Facility Ph. #**	

Field_Observatio there was no dumping into the gutter. The owner said that he dumped the dirty water into the sewer clean out inlet.

INITIAL ACTION the inspector gave the owner some of pollution the prevention brochoures.

Address 1003 TOMASITA AVE NE

EVENT_ID 723 **REPORTING SOURCE** 311 **Complaint_Date** 5/4/2018

CUSTOMER ALBERT CHAVEZ **311CASE_ID** 180504-001408 **e_mai** achavez1217@gmail.com

CUSTOMER Ph# (505) 321-4087 X_Link: ..\2018\180504-001408 1003 Tomasita Ave NE

Complaint: mechanic work from unpermitted business has left fluids on the street

in_gi ☑

Suspected_Facility RESIDENT **Type_of_Complaint** OIL

Inspection_Date 5/17/2018 **Numberof_FieldVisits** 1 **Inspector:** AG

Facility_Contact RESIDENT **Facility Ph. #** na

Field_Observatio there were several oil spots on the street.

INITIAL ACTION we covered the oil spills and distributed pollution prevention brochures at this neighborhood.also forwarded the call to code inspectors at planning

Address	9205 ASHFALL PL NW
EVENT_ID	722
REPORTING SOURCE	311
Complaint_Date	5/1/2018
CUSTOMER	ANGELA PADILLA
311CASE_ID	180501-002758
e_mai	
CUSTOMER Ph#	(505) 362-4642
X_Link:	..\2018\180501-002758 Dumping oil in street
Complaint:	Oil being poured into the street not the storm drain.
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	OIL
Inspection_Date	5/21/2018
Numberof_FieldVisits	1
Inspector:	jm
Facility_Contact	NONE
Facility Ph. #	na
Field_Observatio	did not see any oil dumping
INITIAL ACTION	

Address NORTH GLENWOOD HILLS ARROYO BY TRAMWAY / COMANCHE

EVENT_ID 727 **REPORTING SOURCE** WEB **Complaint_Date** 5/20/2018

CUSTOMER JOHN GNIADY **311CASE_ID** NA **e_mai** j_gniady@yahoo.com

CUSTOMER Ph# (505) 610 2176 X_Link: ..\2018\180522 - North Glenwood Hills Arroyo - Call In

Complaint: Large mattress set in the arroyo

in_gi ☑

Suspected_Facility ARROYO **Type_of_Complaint** TRASH

Inspection_Date 5/22/2018 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact NA **Facility Ph. #**

Field_Observatio not found

INITIAL ACTION no action

Address 6110 ACADEMY NE

EVENT_ID 726 **REPORTING SOURCE** WEB **Complaint_Date** 5/21/2018

CUSTOMER RACHEL MONTES **311CASE_ID** NA **e_mai** academysquare@teamabq.net

CUSTOMER Ph# 821-4651 X_Link: ..\2018\180522 - 6110 Academy

Complaint: 2 mattresses and a water heater

in_gi ☑

Suspected_Facility RESIDENT **Type_of_Complaint** TRASH

Inspection_Date 5/22/2018 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact MANAGER **Facility Ph. #**

Field_Observatio no obejcts were found.

INITIAL ACTION no action

Address	123 PROSPECT NW
EVENT_ID	725
REPORTING SOURCE	311
Complaint_Date	5/8/2018
CUSTOMER	RICHARD ALCANTAR
311CASE_ID	180508-001640
e_mai	afhwj1@yahoo.com
CUSTOMER Ph#	(505) 250-1883
X_Link:	..\2018\180508-001640 - 123 PROSPECT
Complaint:	Homeless RV is dropping Liquid Waste down the Storm Drain on Prospect west of 2nd St.Citizen wants a call back.
in_gi	☑
Suspected_Facility	RV
Type_of_Complaint	SEWAGE
Inspection_Date	5/23/2018
Numberof_FieldVisits	1
Inspector:	GS
Facility_Contact	NA
Facility Ph. #	
Field_Observatio	there was no RV at the site. this RV according to the caller stops by at various time to dump their waste.
INITIAL ACTION	the inspector guided him to contact the code enforcement to put no parking sign at this address.

Address 111 VERMONT NE

EVENT_ID 728 **REPORTING SOURCE** MS4 INSPECTOR **Complaint_Date** 5/24/2018

CUSTOMER GARY SANDOVAL **311CASE_ID** NA **e_mai**

CUSTOMER Ph# 221-1605 X_Link: ..\2018\180524 - 111 Vermont NE

Complaint: there is uncoverted used oil container outside the shop.

in_gi ☑

Suspected_Facility SONNY'S AUTO SHOP **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 5/24/2018 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact OWNER-SONNY NELSON **Facility Ph. #** 316-9972

Field_Observatio there was a big 55-gallon used oil container and several used oil plastic continers in the yard.

INITIAL ACTION the inspector asked to clean up the area and move the container inside. The owner did move the container inside and cleaned up the yard.

Address KELLY CABLE AT 6901 READING SE

EVENT_ID 730 **REPORTING SOURCE** NMED **Complaint_Date** 5/24/2018

CUSTOMER SARAH HOLCOMB **311CASE_ID** NA **e_mai** sarah.holcomb@state.nm.us

CUSTOMER Ph# 505-827-2798 X_Link: ..\2018\180529 - Kelly Cable

Complaint: Kelly Cable in Albuquerque has leaking oil containers and visible oil contamination on the ground around their vehicle maintenance shop

in_gi ☑

Suspected_Facility KELLY CABLE **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 5/29/2018 **Numberof_FieldVisits** 1 **Inspector:** AG

Facility_Contact NA **Facility Ph. #** na

Field_Observatio oil staining on the ground and palettes of super gel-x (drilling fluid) and a pond that may be used for disposing drilling fluid.

INITIAL ACTION this business is located out of city limit.all pictures and info sent to bernalillo county through NMED.

Address	9000 ZUNI SE				
EVENT_ID	729	**REPORTING SOURCE**	CALL	**Complaint_Date**	5/29/2018
CUSTOMER	KEVIN	**311CASE_ID**	NA	**e_mai**	
CUSTOMER Ph#		X_Link:	..\2018\180529 - 9000 Zuni SSO		

Complaint: private sanitary sewer overflow

in_gi ☑

Suspected_Facility	HOME	**Type_of_Complaint**	SEWAGE
Inspection_Date	5/29/2018	**Numberof_FieldVisits**	1
Inspector:	JM		
Facility_Contact	RESIDENT	**Facility Ph. #**	

Field_Observatio

INITIAL ACTION

Address 8301 CASA MORENA CT NW

EVENT_ID 731 **REPORTING SOURCE** 311 **Complaint_Date** 5/30/2018

CUSTOMER ANONYMOUS **311CASE_ID** 180530-000068 **e_mai**

CUSTOMER Ph# X_Link: ..\2018\180530-000068 - 8601 Casa Morena Ct - oil

Complaint: Vehicle is leaking oil all over the side walk.

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** OIL

Inspection_Date 5/30/2018 **Numberof_FieldVisits** 1 **Inspector:** GA

Facility_Contact RESIDENT **Facility Ph. #** na

Field_Observatio a big oil spot under the car

INITIAL ACTION covered the oil spots with absorbent and distributed pollution prevention brochoures at this neighborhood.

Address 3360 COLUMBIA NE

EVENT_ID 732 **REPORTING SOURCE** SPOT CHECK **Complaint_Date** 5/31/2018

CUSTOMER GARY SANDOVAL **311CASE_ID** NA **e_mai**

CUSTOMER Ph# X_Link: ..\2018\180531 - 3360 Columbia Dr NE

Complaint: open used oil buckets in the yard

in_gi ☑

Suspected_Facility **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 5/31/2018 **Numberof_FieldVisits** 1 **Inspector:** ag

Facility_Contact **Facility Ph. #**

Field_Observatio open used oil buckets in the yard

INITIAL ACTION

Address 5808 CORONA NE

EVENT_ID 733 **REPORTING SOURCE** 311 **Complaint_Date** 5/31/2018

CUSTOMER ANONYMOUS **311CASE_ID** 180531-000653 **e_mai**

CUSTOMER Ph# X_Link: ..\2018\180531- 000653_5808 Corona Ave NE

Complaint: hazardous material dumped in storm drain

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** HAZARDOUS MATERIAL

Inspection_Date 6/1/2018 **Numberof_FieldVisits** 1 **Inspector:** gs

Facility_Contact RESIDENT **Facility Ph. #** na

Field_Observatio the resident said that they did empty several swimming pool filters into the storm inlet, they were mainly sand, water and a small amount of chlorine.

INITIAL ACTION the inspector warrant the resident not to repeat his action again and distributed pollution prevention brochures at this neighborhood

Address 7220 SETTLEMENT NW

EVENT_ID	734	**REPORTING SOURCE**	EMAIL TO KATHY	**Complaint_Date**	6/4/2018
CUSTOMER	KATHLEEN VERHAGE	**311CASE_ID**	NA	**e_mai**	
CUSTOMER Ph#		X_Link:	..\2018\180605 - 7220 Settlement Way NW-email-kathy		

Complaint: neighbor's doge poops in her yard

in_gi ☑

Suspected_Facility	HOME	**Type_of_Complaint**	DOG POOPS
Inspection_Date	6/5/2018	**Numberof_FieldVisits**	1
Inspector:	GS		
Facility_Contact	RESIDENT	**Facility Ph. #**	

Field_Observatio the inspector did not find any dog poops in the yard, the resident said that she did clean it up.

INITIAL ACTION the inspector posted several dog poop sign at this neighborhood and also distributed other pollution prevention brochoures at this neighborhood.

Address	2720 MOUNTAIN GATE LN SW

EVENT_ID	739	REPORTING SOURCE	311	Complaint_Date	6/5/2018
CUSTOMER	AMBER ALINK	311CASE_ID	180604-000831	e_mai	amberalink@gmail.com
CUSTOMER Ph#	(505) 301-4625	X_Link:	..\2018\180604-000831 2720 mountain gate sw		

Complaint: Would like to know if grass clippings, dirt, and pine needles can be blown into the strorm drain/ Please call back

in_gi ☑

Suspected_Facility		Type_of_Complaint	TRASH
Inspection_Date	6/5/2018	Numberof_FieldVisits	1
Inspector:	gs		
Facility_Contact		Facility Ph. #	na

Field_Observatio: no visit

INITIAL ACTION: left a phone message for the caller

Address 2435 CHELWOOD PARK NE

EVENT_ID 743 **REPORTING SOURCE** WEB **Complaint_Date** 6/4/2018

CUSTOMER ALICIA DEKLE **311CASE_ID** NA **e_mai** Leeshka337@gmail.com

CUSTOMER Ph# na X_Link: ..\2018\180604-web-2400 chelwood park ne

Complaint: RV tank dumped from chop shop/mechanics lot where the guy lives in back. Horrible smell.

in_gi ☑

Suspected_Facility OWNER **Type_of_Complaint** SEWAGE

Inspection_Date 6/6/2018 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact EAGLE EYE TRANSMISSION **Facility Ph. #** 440-4447

Field_Observatio there were visible sewage in the gutter at this location.the owner said that they had pluged sanitary line problem but they fixed it.

INITIAL ACTION the inspector asked him to clean up the area and spray the area with bleach.also he gave him some pollution prevention brochures.

Address SANITAR SEWER OVERFLOW AT 2920 BROADWAY SE

EVENT_ID 735 **REPORTING SOURCE** KEVIN **Complaint_Date** 6/6/2018

CUSTOMER ABCWUA **311CASE_ID** EMAIL **e_mai**

CUSTOMER Ph# X_Link: ..\2018\180606-broadway at wesmco se-sewage

Complaint: sewage runing down along broadway because of a MH overflow at this address

in_gi ☑

Suspected_Facility SANITARY LINE **Type_of_Complaint** SEWAGE

Inspection_Date 6/6/2018 **Numberof_FieldVisits** 1 **Inspector:** sk

Facility_Contact NA **Facility Ph. #**

Field_Observatio a 96 in sanitary line collaps at broadway and RR track caused sewage overflow at this location.the WA blocked the flow path in san jose drain at Woodward.

INITIAL ACTION WA pumped out all the sewage along broadway and san jose drain, then disinfected the area with chlorine solution.

Address 6804 CAYMAN NW

EVENT_ID 737 **REPORTING SOURCE** 311 **Complaint_Date** 6/12/2018

CUSTOMER ANONYMOUS **311CASE_ID** 180612-001445 **e_mai** na

CUSTOMER Ph# na X_Link: ..\2018\180612-001445 6804 Cayman Ct NW

Complaint: Owner is disposening of human feces in the storm drain in front of address, he was seen lastnight dumping it down his driveway and srpaying it with water down the storm drains

in_gi ☑

Suspected_Facility HOME **Type_of_Complaint** SEWAGE

Inspection_Date 6/12/2018 **Numberof_FieldVisits** 1 **Inspector:** ag

Facility_Contact RESIDENT **Facility Ph. #** na

Field_Observatio inspector did not see any sewage at this location.no answer at the the door knocking.

INITIAL ACTION distributed pollution prevention brochures at this neighborhood.

Address	BARBAR SHOP AT 3738 ISLETA SW

EVENT_ID	738	REPORTING SOURCE	KEVIN-EMAIL	Complaint_Date	6/12/2018
CUSTOMER	KEVIN	311CASE_ID	NA	e_mai	
CUSTOMER Ph#		X_Link:	..\2018\180613 -3738 Isleta SW - SSO Call In		

Complaint: sewage overflow

in_gi ☑

Suspected_Facility	BARBAR SHOP	Type_of_Complaint	SEWAGE

Inspection_Date	6/12/2018	Numberof_FieldVisits	1	Inspector:	gs
Facility_Contact	OWNER-CARLOS CARILLIO	Facility Ph. #	452-1787		

Field_Observatio: no sewage found at this location. The owner of the shop denied dumping any sewage into the gutter.This address is out of city limit.

INITIAL ACTION: no action

Address	9609 SPANISH POINTE PL NW				
EVENT_ID	744	REPORTING SOURCE	WEB	Complaint_Date	6/11/2018
CUSTOMER	HERNESTO TELLEZ	311CASE_ID	NA	e_mai	hernesto.tellez@state.nm.us
CUSTOMER Ph#	5056971606	X_Link:	..\2018\180611-web-9609 spanish pointe		
Complaint:	dumping motor oil into storm drains				
in_gi	☑				
Suspected_Facility	HOME	Type_of_Complaint	OIL		
Inspection_Date	6/14/2018	Numberof_FieldVisits	1	Inspector:	JM
Facility_Contact	RESIDENT	Facility Ph. #			
Field_Observatio	there were several oil spots on the street at this location				
INITIAL ACTION	the inspector asked them to clean up the area.				

Address 10TH AND PACIFIC SW

EVENT_ID 736 **REPORTING SOURCE** 311 **Complaint_Date** 6/11/2018

CUSTOMER CHARLENE HAMMITT **311CASE_ID** 180611-001924 **e_mai** chammitt@hotmail.com

CUSTOMER Ph# (505) 688-5199 X_Link: ..\2018\180611-001924 Oil Haz-Mat Spill 10TH ST SW & PACIFIC AVE S

Complaint: Oil Haz-Mat Spill

in_gi ☑

Suspected_Facility UNKNOWN **Type_of_Complaint** OIL

Inspection_Date 6/19/2018 **Numberof_FieldVisits** 1 **Inspector:** ag

Facility_Contact NA **Facility Ph. #** na

Field_Observatio the oil in the inlet has been cleaned up.

INITIAL ACTION glued drain to rio Grande decal on all the inlets at this area and distributed pollution prevention brochures vat this neighborhood

Address	5328 JESSIE NE
EVENT_ID	740
REPORTING SOURCE	311
Complaint_Date	6/19/2018
CUSTOMER	ANONYMOUS
311CASE_ID	180619-001952
e_mai	na
CUSTOMER Ph#	na
X_Link:	..\2018\180619-001952 Chemicals being poured down storm drain by pr
Complaint:	White chemical being poured down the storm drain that goes down street from address to Jiles ST from owner of address and he has done this 3 times with in the last 4 weeks.
in_gi	☑
Suspected_Facility	HOME
Type_of_Complaint	PAINT
Inspection_Date	6/20/2018
Numberof_FieldVisits	1
Inspector:	JM
Facility_Contact	RESIDENT
Facility Ph. #	na
Field_Observatio	there was a visible white dry residue along the gutter.the resident told the inspector that they washed their plastering tools and dumped it to the gutter.
INITIAL ACTION	the inspector asked the resident to clean it up and not to repeat it again.also he distributed pollution prevention brochures at this neighborhood.

Address 601 LAGUNA BLVD SW

EVENT_ID 741 **REPORTING SOURCE** 311 **Complaint_Date** 6/19/2018

CUSTOMER ANONYMOUS **311CASE_ID** 180619-002063 **e_mai**

CUSTOMER Ph# na X_Link: ..\2018\180619-002063 Grass Ciippings in the Inlet

Complaint: The Country Club maintenance crew are putting the grass clippings in the inlets and this has caused a blockage which is concerning to citizen.

in_gi ☑

Suspected_Facility INLETS **Type_of_Complaint** LEAVES

Inspection_Date 6/20/2018 **Numberof_FieldVisits** 1 **Inspector:** JM

Facility_Contact MANAGER **Facility Ph. #**

Field_Observatio the inspector did not see any grass clipping in the inlets.

INITIAL ACTION the inspector spoke with the manager and asked them not to dump any grass clippings in the inlets.

Address	SW OF CARLISLE NE AND I-40				
EVENT_ID	742	REPORTING SOURCE	WEB	Complaint_Date	6/20/2018
CUSTOMER	DEBBIE HAM & JOHN	311CASE_ID	NA	e_mai	JohnVTL@yahoo.com
CUSTOMER Ph#	505-266-0882	X_Link:	..\2018\180621 - 1800 Indian School Plaza NE - Call In		

Complaint: Abandoned couch and other trash

in_gi ☑

Suspected_Facility	VACANT LAND	Type_of_Complaint	TRASH
Inspection_Date	6/21/2018	Numberof_FieldVisits	1
Inspector:	gs		
Facility_Contact	NA	Facility Ph. #	na

Field_Observatio: there was a lot of trash on this land

INITIAL ACTION: forwarded the case to code enforcement inspectors.

Address ALAMEDA BLVD NE BETWEEN VENTURA AND HOLBROOK

EVENT_ID 746 **REPORTING SOURCE** WEB **Complaint_Date** 6/26/2018

CUSTOMER STEVEN WIRE **311CASE_ID** NA **e_mai** steve-dot@msn.com

CUSTOMER Ph# 385-6883 X_Link: ..\2018\180626_ Illegal Dumping Alameda and Ventura

Complaint: Bed mattress, large tree stump/root dumped on vacant land

in_gi ☑

Suspected_Facility VACANT LAND **Type_of_Complaint** TRASH

Inspection_Date 6/28/2018 **Numberof_FieldVisits** 1 **Inspector:** AG

Facility_Contact NA **Facility Ph. #** na

Field_Observatio there were several large items on this vacant land. This area is out of city limit

INITIAL ACTION informed the caller to contact the county.

Attachment 6

Dry Weather Screening Results

Location 01 | **SAN JOSE DRAIN AT WOODWARD**

DATE	1/30/2018	TIME	1:15 PM	WEATHER	cloudy

SUSPECTED SOURCE	na	EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na	APPEARANCE	
AIR TEMP,°F	56.0	OBSERV GROSS POLLUT:	
WATER TEMP,°F		INSPECTOR	SK
PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 02	BROADWAY POND INFLOW CHANNEL

DATE	1/30/2018	TIME	10:30 AM	WEATHER	cloudy
SUSPECTED SOURCE	boiler water of loveles hospital			EST. FlOW, CFS	0.01
SUSPECTED PROBLEM TYPE	Nuisance Flow			APPEARANCE	clear
AIR TEMP,°F	40.0	OBSERV GROSS POLLUT:	none		
WATER TEMP,°F	39.0	INSPECTOR	SK		
PH:	8.23	E_coli_Coliform mpn/100ml:	25.6		
CONDUCTIVITY, µmos/cm	850.0	OIL and GREASE, MG/L:	<9.16		
BOD, MG/L:	2.0	AMMONIA, MG/L N:	<1.0		
COD, MG/L:	16.9	Nitrite NO2, MG/L:	<0.1		
TSS, MG/L:	<4.0	Nitrate NO3, MG/L:	0.89		
TDS, MG/L:	479	TOTAL PHOSPHORUS, MG/L P	0.86		

Location 03 **MENAUL POND INFLOW CHANNEL**

DATE	1/25/2018	**TIME**	9:20 AM	**WEATHER**	sunny
SUSPECTED SOURCE	na			**EST. FlOW, CFS**	0.00
SUSPECTED PROBLEM TYPE	na			**APPEARANCE**	
AIR TEMP,°F	30.0	**OBSERV GROSS POLLUT:**			
WATER TEMP,°F				**INSPECTOR**	SK
PH:				**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm				**OIL and GREASE, MG/L:**	
BOD, MG/L:				**AMMONIA, MG/L N:**	
COD, MG/L:				**Nitrite NO2, MG/L:**	
TSS, MG/L:				**Nitrate NO3, MG/L:**	
TDS, MG/L:				**TOTAL PHOSPHORUS, MG/L P**	

Location 04 **BARELAS PS-32**

DATE	1/29/2018	TIME	10:30 AM	WEATHER	sunny
SUSPECTED SOURCE	groundwater infiltration			EST. FlOW, CFS	0.10
SUSPECTED PROBLEM TYPE	Nuisance Flow			APPEARANCE	clear
AIR TEMP,°F	38.0	OBSERV GROSS POLLUT:	none		
WATER TEMP,°F	49.0	INSPECTOR	SK		
PH:	8.18	E_coli_Coliform mpn/100ml:	435.2		
CONDUCTIVITY, µmos/cm	595.0	OIL and GREASE, MG/L:	<9.52		
BOD, MG/L:	2.0	AMMONIA, MG/L N:	<1.0		
COD, MG/L:	<10.0	Nitrite NO2, MG/L:	<0.1		
TSS, MG/L:	5	Nitrate NO3, MG/L:	0.27		
TDS, MG/L:	364	TOTAL PHOSPHORUS, MG/L P	0.26		

Location 05 **KIRTLAND CHANNEL AT SOUTH DIVERSION CHANNEL**

DATE	1/24/2018	TIME	2:20 AM	WEATHER	sunny

SUSPECTED SOURCE	na	EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na	APPEARANCE	
AIR TEMP,°F	50.0	OBSERV GROSS POLLUT:	
WATER TEMP,°F		INSPECTOR	SK
PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 06 **SAN ANTONIO ARROYO AT USGS GAGE (RIVER)**

DATE	2/1/2018	TIME	10:30 AM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	46.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F		INSPECTOR	SK		
PH:		E_coli_Coliform mpn/100ml:			
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:			
BOD, MG/L:		AMMONIA, MG/L N:			
COD, MG/L:		Nitrite NO2, MG/L:			
TSS, MG/L:		Nitrate NO3, MG/L:			
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P			

Location 07	CALABACILLAS ARROYO AT RIO GRANDE	

DATE	2/1/2018	**TIME**	11:00 AM	**WEATHER**	sunny

SUSPECTED SOURCE	na	**EST. FlOW, CFS**	0.00
SUSPECTED PROBLEM TYPE	na	**APPEARANCE**	

AIR TEMP,°F	49.0	**OBSERV GROSS POLLUT:**	
WATER TEMP,°F		**INSPECTOR**	SK
PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Location 08	HAHN ARROYO AT CARLISLE

DATE	1/25/2018	TIME	9:55 AM	WEATHER	sunny

SUSPECTED SOURCE: na

EST. FlOW, CFS: 0.00

SUSPECTED PROBLEM TYPE:

APPEARANCE:

AIR TEMP,°F: 33.0

OBSERV GROSS POLLUT:

WATER TEMP,°F:

INSPECTOR: SK

PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 09 **EMBUDO ARROYO AT PENNSYLVANIA**

DATE	1/30/2018	TIME	2:00 PM	WEATHER	cloudy
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	57.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 10 | **HIGHLANDS SYSTEM OUTFALL AT UNM HOSPITAL**

DATE	1/30/2018	**TIME**	1:30 PM	**WEATHER**	cloudy

SUSPECTED SOURCE		**EST. FlOW, CFS**	
SUSPECTED PROBLEM TYPE		**APPEARANCE**	
AIR TEMP,°F	56.0	**OBSERV GROSS POLLUT:**	
WATER TEMP,°F		**INSPECTOR**	SK
PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Location 11 | **BEAR CANYON ARROYO AT NORTH DIVERSION CHANNEL-OSUNA**

DATE	1/25/2018	**TIME**	10:10 AM	**WEATHER**	sunny

SUSPECTED SOURCE	na	**EST. FIOW, CFS**	0.00
SUSPECTED PROBLEM TYPE	na	**APPEARANCE**	
AIR TEMP,°F	35.0	**OBSERV GROSS POLLUT:**	
WATER TEMP,°F		**INSPECTOR**	SK
PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Location	12	SOUTH PINO ARROYO AT WASHINGTON

DATE	1/25/2018	TIME	10:25 AM	WEATHER	sunny

SUSPECTED SOURCE	na	EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na	APPEARANCE	
AIR TEMP,°F	36.0	OBSERV GROSS POLLUT:	
WATER TEMP,°F		INSPECTOR	SK
PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 13 | **NORTH PINO ARROYO AT NORTH DIVERSION CHANNEL**

DATE	1/25/2018	**TIME**	10:35 AM	**WEATHER**	sunny

SUSPECTED SOURCE na

EST. FlOW, CFS 0.00

SUSPECTED PROBLEM TYPE na

APPEARANCE

AIR TEMP,°F	36.0	**OBSERV GROSS POLLUT:**	
WATER TEMP,°F		**INSPECTOR**	SK
PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Location 14	SOUTH DOMINGO BACA ARROYO AT WASHINGTON

DATE	1/26/2018	TIME	10:50 AM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	45.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 15	**AMOLE DEL NORTE CHANNEL AT BLAKE RD**

DATE	1/31/2018	**TIME**	10:30 AM	**WEATHER**	sunny

SUSPECTED SOURCE	irrigation water from Tower pond park at 82nd st and tower	**EST. FlOW, CFS**	0.05
SUSPECTED PROBLEM TYPE	Nuisance Flow	**APPEARANCE**	clear
AIR TEMP,°F	48.0	**OBSERV GROSS POLLUT:**	none
WATER TEMP,°F	38.0	**INSPECTOR**	SK
PH:	8.39	**E_coli_Coliform mpn/100ml:**	4.1
CONDUCTIVITY, µmos/cm	405.0	**OIL and GREASE, MG/L:**	<9.38
BOD, MG/L:	3.0	**AMMONIA, MG/L N:**	<1.0
COD, MG/L:	<10.0	**Nitrite NO2, MG/L:**	<0.1
TSS, MG/L:	6.0	**Nitrate NO3, MG/L:**	0.66
TDS, MG/L:	238	**TOTAL PHOSPHORUS, MG/L P**	0.012

Location	16	WEST BLUFF I-40 OUTFALL AT RIO GRANDE

DATE	2/1/2018	TIME	9:55 AM	WEATHER	sunny

SUSPECTED SOURCE	na	EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE		APPEARANCE	
AIR TEMP,°F	42.0	OBSERV GROSS POLLUT:	na
WATER TEMP,°F		INSPECTOR	SK
PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 17 **SNOW VISTA ARROYO AT SAGE RD**

DATE	2/1/2018	TIME	9:10 AM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	38.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 18 **Montano East of Coors**

DATE	1/26/2018	**TIME**	2:25 PM	**WEATHER**	sunny

SUSPECTED SOURCE na **EST. FlOW, CFS** 0.00

SUSPECTED PROBLEM TYPE na **APPEARANCE**

AIR TEMP,°F 47.0 **OBSERV GROSS POLLUT:**

WATER TEMP,°F **INSPECTOR** SK

PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Location 19 | **Montano PS-47 west of Rio Grande Blvd**

DATE	1/26/2018	TIME	2:10 PM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	47.0			OBSERV GROSS POLLUT:	
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 20 | **Candelaria PS-40**

DATE	1/25/2018	**TIME**	2:40 PM	**WEATHER**	sunny
SUSPECTED SOURCE	na			**EST. FlOW, CFS**	0.00
SUSPECTED PROBLEM TYPE	na			**APPEARANCE**	
AIR TEMP,°F	52.0	**OBSERV GROSS POLLUT:**	na		
WATER TEMP,°F		**INSPECTOR**	SK		
PH:		**E_coli_Coliform mpn/100ml:**			
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**			
BOD, MG/L:		**AMMONIA, MG/L N:**			
COD, MG/L:		**Nitrite NO2, MG/L:**			
TSS, MG/L:		**Nitrate NO3, MG/L:**			
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**			

Location 21 — Namaste and Coors

DATE	2/1/2018	TIME	10:45 AM	WEATHER	sunny

SUSPECTED SOURCE: na

EST. FlOW, CFS: 0.00

SUSPECTED PROBLEM TYPE: na

APPEARANCE:

AIR TEMP,°F: 48.0

OBSERV GROSS POLLUT:

WATER TEMP,°F:

INSPECTOR: SK

PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 22	Snow Goose at Oxbow Bluff

DATE	2/6/2018	TIME	3:00 PM	WEATHER	cloudy

SUSPECTED SOURCE	na	EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na	APPEARANCE	
AIR TEMP,°F	56.0	OBSERV GROSS POLLUT:	
WATER TEMP,°F		INSPECTOR	SK
PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 23 | **Sequoia**

DATE	2/2/2018	TIME	2:20 PM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE				APPEARANCE	
AIR TEMP,°F	62.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 24 | **Redlands-Grande Vista**

DATE	2/2/2018	TIME	2:40 PM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	62.0			OBSERV GROSS POLLUT:	
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location	25	Paseo del rey-ouray-vista grande

DATE	2/5/2018	TIME	1:45 PM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	65.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 26 | **Duranes PS**

DATE	1/25/2018	**TIME**	2:00 AM	**WEATHER**	sunny

SUSPECTED SOURCE	na	**EST. FlOW, CFS**	0.00
SUSPECTED PROBLEM TYPE	na	**APPEARANCE**	
AIR TEMP,°F	51.0	**OBSERV GROSS POLLUT:**	
WATER TEMP,°F		**INSPECTOR**	SK
PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Location 27 **calle del vista-Atrisco**

DATE	2/1/2018	TIME	10:10 AM	WEATHER	sunny

SUSPECTED SOURCE: na

EST. FlOW, CFS: 0.00

SUSPECTED PROBLEM TYPE: na

APPEARANCE:

AIR TEMP,°F: 45.0

OBSERV GROSS POLLUT:

WATER TEMP,°F:

INSPECTOR: SK

PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 28 **westcliffe and josephine nw**

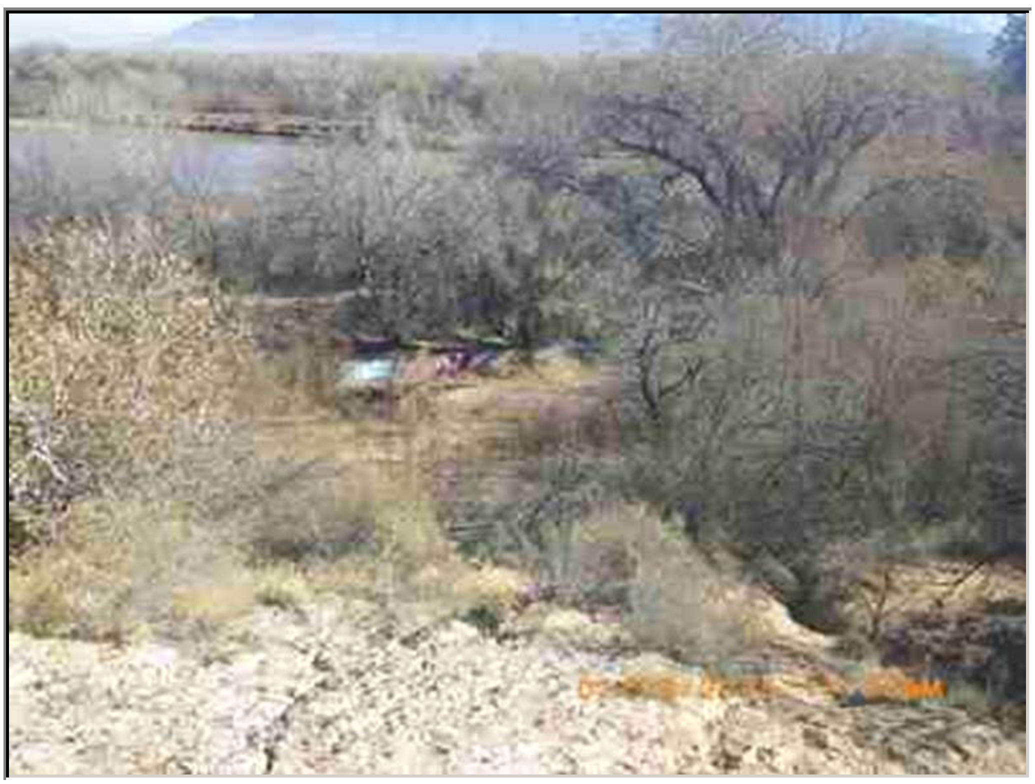
DATE	2/5/2018	TIME	1:35 PM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	65.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 29 | **San Jose drain at abq riverside drain**

DATE	2/1/2018	TIME	2:00 PM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	64.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 30 **Atrisco-Atrisco Pl-riverview**

DATE	2/2/2018	TIME	11:05 AM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	50.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	



Location 31 | **Labajada-atrisco-north 30 in pipe**

DATE	2/2/2018	TIME	10:45 AM	WEATHER	sunny
SUSPECTED SOURCE	na			EST. FIOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	50.0			OBSERV GROSS POLLUT:	
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 32 **Labajada-atrisco-south 36 in pipe**

DATE	2/2/2018	TIME	10:50 AM	WEATHER	sunny

SUSPECTED SOURCE	na	EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na	APPEARANCE	
AIR TEMP,°F	50.0	OBSERV GROSS POLLUT:	
WATER TEMP,°F		INSPECTOR	SK
PH:		E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm		OIL and GREASE, MG/L:	
BOD, MG/L:		AMMONIA, MG/L N:	
COD, MG/L:		Nitrite NO2, MG/L:	
TSS, MG/L:		Nitrate NO3, MG/L:	
TDS, MG/L:		TOTAL PHOSPHORUS, MG/L P	

Location 33 **central-sunset-Osage PS-44-2 pipes 36 and 42 in**

DATE	1/30/2018	TIME	12:40 PM	WEATHER	cloudy
SUSPECTED SOURCE	na			EST. FlOW, CFS	0.00
SUSPECTED PROBLEM TYPE	na			APPEARANCE	
AIR TEMP,°F	55.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F				INSPECTOR	SK
PH:				E_coli_Coliform mpn/100ml:	
CONDUCTIVITY, µmos/cm				OIL and GREASE, MG/L:	
BOD, MG/L:				AMMONIA, MG/L N:	
COD, MG/L:				Nitrite NO2, MG/L:	
TSS, MG/L:				Nitrate NO3, MG/L:	
TDS, MG/L:				TOTAL PHOSPHORUS, MG/L P	

Location 34 **central-sunset-Osage PS-44-6 in pipe**

DATE	1/30/2018	TIME	1:00 PM	WEATHER	cloudy
SUSPECTED SOURCE	ground water			EST. FlOW, CFS	0.10
SUSPECTED PROBLEM TYPE	Nuisance Flow			APPEARANCE	clear
AIR TEMP,°F	55.0	OBSERV GROSS POLLUT:	none		
WATER TEMP,°F	59.0	INSPECTOR	SK		
PH:	7.96	E_coli_Coliform mpn/100ml:	108.1		
CONDUCTIVITY, µmos/cm	604.0	OIL and GREASE, MG/L:	<9.17		
BOD, MG/L:	<2	AMMONIA, MG/L N:	<1.0		
COD, MG/L:	<10	Nitrite NO2, MG/L:	<0.1		
TSS, MG/L:	94	Nitrate NO3, MG/L:	<0.1		
TDS, MG/L:	358	TOTAL PHOSPHORUS, MG/L P	0.26		

Location 35 | **Alcalde PS-41**

DATE	1/29/2018	TIME	10:00 AM	WEATHER	sunny
SUSPECTED SOURCE	water tanker inside the zoo emptying their tank			EST. FlOW, CFS	0.05
SUSPECTED PROBLEM TYPE	Nuisance Flow			APPEARANCE	clear
AIR TEMP,°F	36.0	OBSERV GROSS POLLUT:			
WATER TEMP,°F	44.0			INSPECTOR	SK
PH:	8.20			E_coli_Coliform mpn/100ml:	1
CONDUCTIVITY, µmos/cm	428.0			OIL and GREASE, MG/L:	<9.34
BOD, MG/L:	4.0			AMMONIA, MG/L N:	<1.0
COD, MG/L:	<10.0			Nitrite NO2, MG/L:	<0.1
TSS, MG/L:	<4			Nitrate NO3, MG/L:	0.22
TDS, MG/L:	281			TOTAL PHOSPHORUS, MG/L P	0.21

Location 36 **NDC at Edith**

DATE	1/26/2018	TIME	10:00 AM	WEATHER	sunny
SUSPECTED SOURCE	waterwells wash water			EST. FlOW, CFS	0.10
SUSPECTED PROBLEM TYPE	Nuisance Flow			APPEARANCE	clear
AIR TEMP,°F	40.0	OBSERV GROSS POLLUT:	none		
WATER TEMP,°F	37.0			INSPECTOR	SK
PH:	8.12			E_coli_Coliform mpn/100ml:	24.1
CONDUCTIVITY, µmos/cm	568.0			OIL and GREASE, MG/L:	<9.68
BOD, MG/L:	10.0			AMMONIA, MG/L N:	<1.0
COD, MG/L:	50.5			Nitrite NO2, MG/L:	<0.1
TSS, MG/L:	<8			Nitrate NO3, MG/L:	<0.1
TDS, MG/L:	636			TOTAL PHOSPHORUS, MG/L P	0.093

Location 37 | **Tijeras at 2nd st sw**

DATE	2/1/2018	**TIME**	2:15 PM	**WEATHER**	sunny

SUSPECTED SOURCE	na	**EST. FlOW, CFS**	0.00
SUSPECTED PROBLEM TYPE	na	**APPEARANCE**	
AIR TEMP,°F	64.0	**OBSERV GROSS POLLUT:**	
WATER TEMP,°F		**INSPECTOR**	SK
PH:		**E_coli_Coliform mpn/100ml:**	
CONDUCTIVITY, µmos/cm		**OIL and GREASE, MG/L:**	
BOD, MG/L:		**AMMONIA, MG/L N:**	
COD, MG/L:		**Nitrite NO2, MG/L:**	
TSS, MG/L:		**Nitrate NO3, MG/L:**	
TDS, MG/L:		**TOTAL PHOSPHORUS, MG/L P**	

Attachment 7

Visual Monitoring Results

Weston Solutions, Inc.
3840 Commons Ave. NE
Albuquerque, NM 87109
505-837-6520 Fax 505-837-6595
www.westonsolutions.com

July 19, 2018

Ms. Kathy Verhage, P.E.
Department of Municipal Development - Storm Drainage Design
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Reference: PROJECT NO. 8010 CITYWIDE ON-CALL NPDES AND MS4 ENGINEERING SUPPORT SERVICES 2nd QUARTER 2018 UPDATE FOR TASK 19 VISUAL STORM WATER INSPECTIONS

Dear Ms. Verhage:

This Memo describes the results of the 2018 Quarter 2 (April 1 through June 30) Visual Storm Water Inspections for 24 City of Albuquerque (City) facilities. This evaluation and memo has been prepared to address the requirements of the U.S. Environmental Protection Agency's (EPA) Municipal Separate Storm Sewer System (MS4) Permit issued to the City in 2014 and the Multi Sector General Permit for Storm Water Discharges Associated with Industrial Activity (MSGP) at City-owned facilities. The purpose of this memo is to document the City's compliance with the requirements required for quarterly stormwater monitoring.

To comply with the MS4 and MSGP's requirements for stormwater monitoring, the City tasked Weston Solutions and CDM Smith with performing quarterly visual stormwater monitoring at 24 City-owned facilities. These facilities meet the definition of an industrial facility in the MSGP based on audits of City-owned facilities performed between 2012 and 2018. The following facilities are monitored using visual inspection methods to identify potential impacted stormwater discharges. Locations of these facilities are shown in Figure 1 with additional detail information provided in Table 1. Several facilities were not inspected during the second quarter as few qualifying storm events occurred during the quarter. The facility list and status of monitoring are shown below.

- Arroyo Del Oso Golf Course (Visited, samples collected at two outfalls)
- Storm Drainage Maintenance Arroyo Maintenance Section (Visited, samples collected at one outfall)
- Balloon Fiesta Park and Golf Training Center (Visited, sample collected at one outfall)
- Albuquerque BioPark Zoo (Visited, sample collected at one outfall)
- West Side Maintenance Facility (Daytona) (Facility not visited)
- Fire Department Mechanic Shop (Visited, samples collected at two outfalls)
- 4th Street Fuel Station (Visited, samples collected at one outfall)
- Lomas Fuel Station (Visited, samples collected at one outfall)
- Ladera Golf Course (Facility not visited)
- Los Altos Golf Course (Visited, samples collected at two outfalls)
- Montessa Park Open Space (Visited, sample not collected)
- Pino Yards Complex (Visited, samples collected at two outfalls)
- Puerto del Sol Golf Course (Facility not visited)
- Streets Maintenance Satellite #1 (Visited, samples collected at two outfalls)
- Street Maintenance Satellite #2 (Visited, no samples collected)
- Street Maintenance Satellite #3 (Facility not visited)
- Yale Maintenance Facility (Facility not visited)
- 6th Street Park Management (Visited, samples collected at one outfall)
- Los Altos Park Management (Visited, sample collected at one outfall)
- Los Altos Medians Park Management (Visited, sample collected at one outfall)

- Montessa Park Convenience Center (Visited, sample not collected)
- Don Reservoir Convenience Center (Facility not visited)
- Eagle Rock Convenience Center (Visited, samples collected at two outfalls)
- Edith Yards Maintenance Facility (Visited, sample collected at one outfall)

Figure 1 shows the outfall identification names along with the inspection team responsible for monitoring the particular outfall.

July 19, 2018

Figure 1: Facility Site Locations

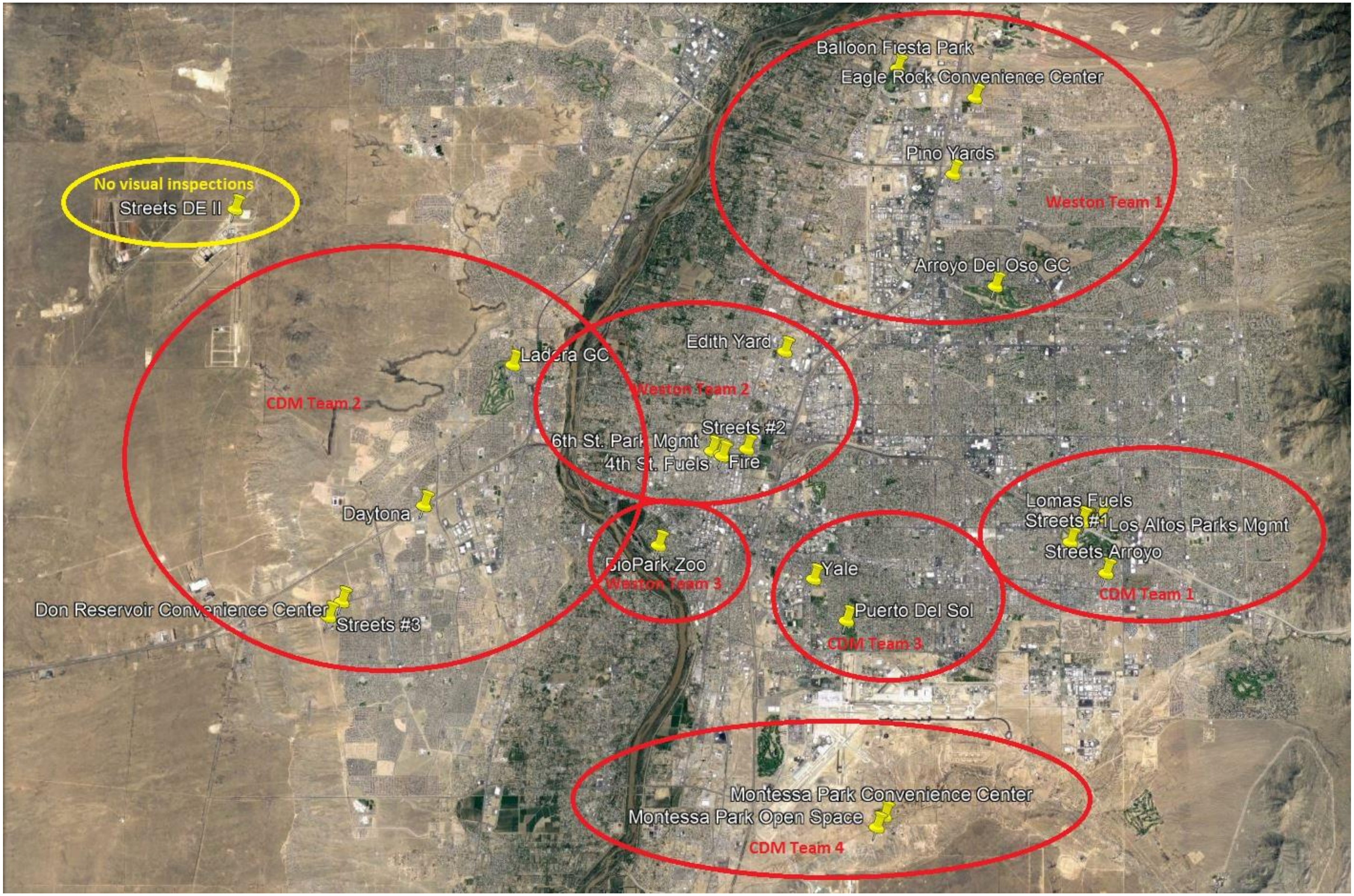


Table 1: Outfall ID and Designees

Site	Outfall ID	2018 Q2 Status
Weston 1		
Balloon Fiesta Park and Golf Training Center	BFP1	Visited, dry – no sample
	BFP2	Visited, dry – no sample
	BFP3	Visited, sample collected
	BFP4	Visited, dry – no sample
	BFP5	Visited, dry – no sample
Pino Yards Complex	PY1	Visited, dry – no sample
	PY2	Visited, sample collected
	PY3	Visited, sample collected
Arroyo Del Oso Golf Course	ADO1	Visited, sample collected
	ADO2	Visited, sample collected
Eagle Rock Convenience Center	ER01	Visited, sample collected
	ER02	Visited, sample collected
	ER03	Visited, sample collected
Weston 2		
4th Street Fuel Station	FS1	Visited, sample collected
Fire Department Mechanic Shop	FM1	Visited, sample collected
	FM2	Visited, sample collected
Street Maintenance Satellite #2	SS2	Visited, dry – no sample
Edith Yards Maintenance Facility	EY01	Visited, sample collected
	EY02	Visited, dry – no sample
	EY03	Visited, dry – no sample
6th Street Park Management	6PM1	Visited, sample collected
CDM Smith 1		
Los Altos Golf Course	LA1	Visited, sample collected
	LA2	Visited, sample collected
Lomas Fuel Station	L1	Visited, sample collected
Storm Drainage Maintenance Arroyo	AM1	Visited, sample collected
Street Maintenance Satellite #1	SS1A	Visited, sample collected
	SS1B	Visited, sample collected
Los Altos Park Management	LAP1	Visited, sample collected
Los Altos Medians Park Management	LAM1	Visited, sample collected
CDM Smith 2		
West Side Maintenance Facility (Daytona)	D1	Site not visited
	D2	Site not visited
Ladera Golf Course	LGC1	Site not visited
	LGC2	Site not visited
Street Maintenance Satellite #3	SS3	Site not visited
Don Reservoir Convenience Center	DR01	Site not visited
CDM Smith 3		
Puerto Del Sol Golf Course	PDS1	Site not visited
	PDS2	Site not visited
Yale Maintenance Facility	Y1	Site not visited

Site	Outfall ID	2018 Q2 Status
CDM Smith 4		
Montessa Park Open Space	MP1	Visited, dry – no sample
	MP2	Visited, dry – no sample
Montessa Park Convenience Center	MP01	Visited, dry – no sample
	MP02	Visited, dry – no sample
Weston 3		
ABQ BioPark Zoo	BP1	Visited, sample collected

Background

The MSGP establishes requirements for monitoring the quality of stormwater discharges depending on the nature of activities performed at the various industrial facilities. Although benchmark monitoring is not required, the MSGP does require quarterly visual assessment of stormwater quality. Visual assessment consists of the collection of grab samples from each outfall (subject to demonstration of substantially identical outfalls) and examination for the presence of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other indicators of stormwater pollution.

Certain criteria regarding the precipitation event must be met for an assessment event. Visual assessment of stormwater must occur:

- During daylight hours
- Within 30 minutes of start of storm water discharge (or as soon as practicable thereafter)
- At least 72 hours after the previous storm water discharge event

Weston follows the City's existing stormwater monitoring protocol outlining the locations and descriptions of all outfalls to be monitored. The protocol identifies contact persons at each facility for use in notifying City personnel when members of the stormwater monitoring team are mobilizing to that location. A standard visual assessment form is used by all staff to document the monitoring activities.

Quarter 2 Monitoring Results

The 2nd Quarter sampling period ran from April 1 to June 30, 2018.

- Weston Sites Group 1 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 5 out of 13 outfalls over the course of the 1 mobilization. One sample was collected from each of the following facilities: Balloon Fiesta Park. Two samples were collected from each of the following facilities: Pino Yards, and Arroyo del Oso Golf Course.
- Weston Sites Group 2 mobilized 2 times during the quarter to collect samples from storm events. Visual samples were collected from 8 out of 8 outfalls over the course of the 2 mobilizations. No samples were collected from Streets #2. Repeat samples were collected at 4th St Fuels, 6th St Parks Management, and the Fire Maintenance.
- Weston Sites Group 3 (BioPark) mobilized 2 times during the quarter to collect samples from storm events. Visual samples were collected from 1 out of 1 outfalls over the course of the 2 mobilizations.
- CDM Smith Sites Group 1 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 8 out of 8 outfalls over the course of the 1 mobilization.
- CDM Smith Sites Group 2 did not mobilize during the quarter.
- CDM Smith Sites Group 3 did not mobilize during the quarter.

- CDM Smith Sites Group 4 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 0 out of 4 outfalls over the course of the 1 mobilization.

The monitoring reports and photo logs from Weston Sites Groups 1 through 3 and CDM Smith Sites Groups 1-4 can be found in the Appendix. Any outfalls not monitored in Quarter 2 will be made up during Quarter 3 of 2018 pending suitable weather conditions.

Observed Problems

In general very few pollution problems were observed at any of the outfalls with few exceptions. Many of the grab samples exhibited presence of sediment, but no pollutants required follow up inspections or actions to occur. There were limited to no issues with oils, floatables, salts, chemicals, or other pollutant sources.

Results from the Quarter 2 Visual Inspections can be found in the Appendix. Twenty three out of 24 facilities were observed during the 2nd Quarter. As noted above, the 2nd Quarter experienced only two storm events that produced measurable runoff. Many sites received no rain due to the localized nature of the storm that did occur. Any facilities or outfalls that did not produce a sample in Quarter 2, 2018 will be made up in the coming months.

We appreciate the opportunity to provide professional consulting services to you and we look forward to assisting you in the next quarter. Please contact

Sarah Luckie at (720) 937-5905 (Sarah.Luckie@WestonSolutions.com) or
Brad Sumrall at (505) 837-6566 (Brad.Sumrall@WestonSolutions.com) if you have any questions or need additional information.

Sincerely,
WESTON SOLUTIONS, INC.

L. Brad Sumrall

L. Brad Sumrall, PE
Albuquerque Operations Manager

ATTACHMENT A: Q1 INSPECTION FORMS AND PHOTO LOGS

ATTACHMENT B: NON-QUALIFYING MEMO

APPENDIX A: Q2 INSPECTION FORMS & PHOTO LOGS- VISUAL INSPECTIONS

STREETS SATELLITE #1

City of Albuquerque
Street Maintenance Satellite #1

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☑Q2 ☐Q3 ☐Q4

Date: 5/21/18
Time: 3:34
Inspector: Amy Reed

Weather: post precipitation
Storm Precip: 0.12in
Last 72 hour Precip: NONE
Photo: SS1A:3, SS1B:3

Outfall ID:	**SS1A**	**SS1B**
Flow Observed:	☐Yes ☑No	☑Yes ☐No
Description of Monitoring Site:	No flow to drain. minor standing water puddles nearby.	Flow to drain buffered by a berm. standing water around drain
Flow Estimate (include units and method of estimation):	Ø cfs	< 0.1 cfs
Other Observations:	No employees in the vicinity. No maintenance or vehicle fueling observed. No spills/stains	
Color (describe):	slight tint of brown	slight tint of Brown
Turbidity:	☐Clear ☐Slightly Cloudy ☑Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☑Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☑No	☐Yes ☑No
Suspended Solids:	☑Yes ☐No	☑Yes ☐No
Settled Solids:	☑Yes ☐No	☑Yes ☐No
Sheen Present:	☐Yes ☑No	☐Yes ☑No
Odor:	☐Yes ☑No	☐Yes ☑No
Foam Present:	☐Yes ☑No	☐Yes ☑No
Describe:	Took a sample of nearby standing water puddles	pulled from water by storm drain berm

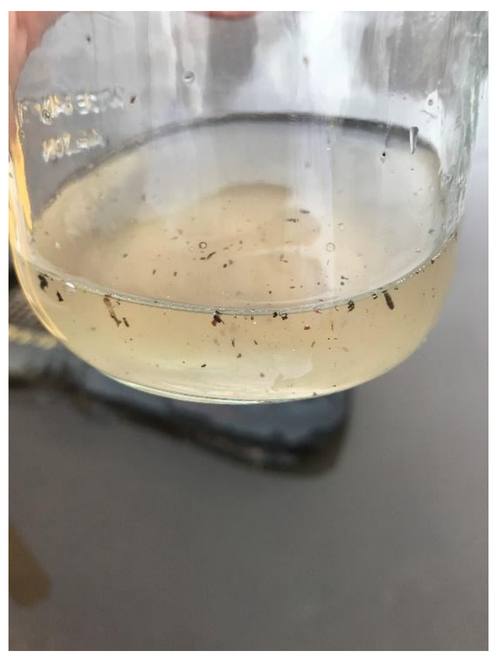
Additional Comments: sediment seems more gritty and darker than at SS1B.

CDM Smith

Date:	May 21, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	CDM Smith

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Street Maintenance Satellite #1



STREETS SATELLITE #2

City of Albuquerque
Street Maintenance Satellite #2

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date:	5/21/18	Weather:	Sunny & Cloudy
Time:	1602	Storm Precip:	
Inspector:	Andrew Brenner	Last 72 Hour Precip:	no
Signature:	Andrew F Brenner	Photo:	yes

Outfall ID:	SS2
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	only a small flow was flowing - not enough to collect a sample
Flow Estimate (include units and method of estimation) :	< 1cfs
Other Observations:	tumbleweeds were in the outlet
Color (Describe):	—
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No
Odor:	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No
Describe:	—

Additional Comments:

WESTON SOLUTIONS

Date: 5/21/2018

Event: Visual Inspections

Inspector: Andrew Brenner (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Streets #2	
	

STREETS SATELLITE #3

STREETS SATELLITE ARROYO MAINTENANCE

City of Albuquerque

Storm Drainage Maintenance Arroyo Maintenance Section

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐Q1 ☑Q2 ☐Q3 ☐Q4

Date: 5-21-18
Time: 4:55pm
Inspector: Amy Reed

Weather: post-precipitation
Storm Precip: 0.12in
Last 72 hour Precip: NONE
Photo: 3

Outfall ID:	**AM1**	
Flow Observed:	☑Yes	☐No
Description of Monitoring Site:	Water draining down concrete culvert at steep grate to outfall AM1	
Flow Estimate (include units and method of estimation):	>0.1cfs	
Other Observations:		
Color (describe):	Tinted light Brown	
Turbidity:	☐Clear ☐Slightly Cloudy ☑Very Cloudy ☐Opaque	
Floating Solids:	☑Yes	☐No
Suspended Solids:	☑Yes	☐No
Settled Solids:	☐Yes	☑No
Sheen Present:	☐Yes	☑No
Odor:	☐Yes	☑No
Foam Present:	☐Yes	☑No
Describe:		

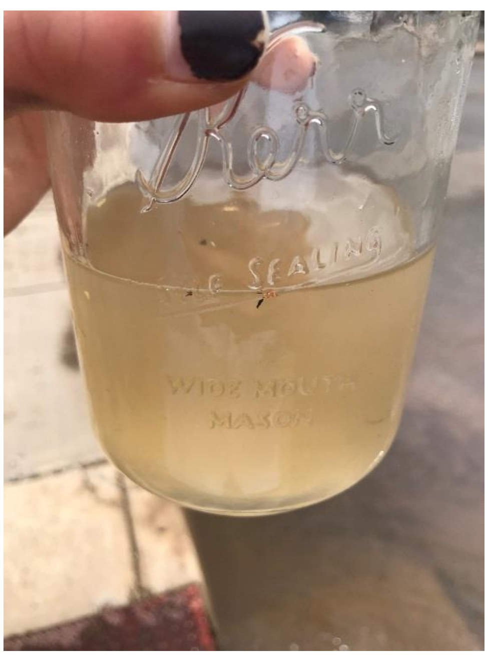
Additional Comments: ______________________

Date: May 21, 2018

Event: MS4 Visual Storm Monitoring

Inspector: CDM Smith

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Storm Drainage Maintenance Arroyo Maintenance Section	
	
	

PINO YARDS

City of Albuquerque
Pino Yards Complex

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date:	05/21/2018	Weather:	Overcast
Time:	3:51 pm	Storm Precip:	0.42 in
Inspector:	Kathryn Hayden	Last 72 Hour Precip:	∅
Signature:	KAH	Photo:	Attached

Outfall ID:	PY1	PY2	PY3
Flow Observed:	☐ Yes ☒ No	☒ Yes ☐ No	☒ Yes ☐ No
Description of Monitoring Site:	grate covered in debris	grate covered in debris	Outflow to detention pond. Lots of sediment
Flow Estimate (include units and method of estimation) :	none	< 1 cfs	< 1 cfs
Other Observations:	~~wattle needs to be repositioned~~	wattle needs to be repositioned	~~blackish tan~~
Color (Describe):		tan	blackish tan
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No
Suspended Solids:	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No
Settled Solids:	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No
Sheen Present:	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No
Odor:	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No
Describe:			

Additional Comments:

WESTON SOLUTIONS.

Date: May 21, 2018

Event: MS4 Stormwater Visual Inspection

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Pino Yards

PY1

PY2

PY2 Flow

PY2 Sample

PY3 Flow

PY3 Sheen

PY3 Sample

TRANSIT- YALE

TRANSIT- DAYTONA

BALLOON FIESTA PARK/ GOLF TRAINING CENTER

City of Albuquerque

Balloon Fiesta Park and Golf Training Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date:	5/21/2018	Weather:	Overcast
Time:	3:30 pm	Storm Precip:	0.42 in
Inspector:	Kathryn Hayden	Last 72 Hour Precip:	Ø
Signature:	KH	Photo:	Attached

Outfall ID:	BFP1	BFP2	BFP3
Flow Observed:	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No
Description of Monitoring Site:			Southeast outfall
Flow Estimate (include units and method of estimation) :			<1 cfs
Other Observations:			lots of foam present
Color (Describe):			tan
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☒ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No
Odor:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Describe:			

Additional Comments: Flows had already stopped at BFP1, BFP2, BFP4, BFP5

WESTON SOLUTIONS

City of Albuquerque
Balloon Fiesta Park and Golf Training Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 5/21/2018
Time: 3:30 pm
Inspector: Kathryn Hayden
Signature: [signature]

Weather: Overcast
Storm Precip: 0.42 in
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	BFP4	BFP5
Flow Observed:	☐ Yes ☒ No	☐ Yes ☒ No
Description of Monitoring Site:		
Flow Estimate (include units and method of estimation) :		
Other Observations:		
Color (Describe):		
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☐ No
Odor:	☐ Yes ☐ No	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☐ No
Describe:		

Additional Comments:

WESTON SOLUTIONS

Date: May 21, 2018

Event: MS4 Stormwater Visual Inspection

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Balloon Fiesta Park

BFP1

BFP2

BFP3 Flow

BFP3 Sample

 BFP4	 BFP5

MONTESSA PARK

LOS ALTOS GOLF COURSE

City of Albuquerque
~~Street Maintenance Satellite #1~~
Los Altos Golf Course
Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☑Q2 ☐Q3 ☐Q4

Date: 5-21-18
Time: 3:07pm
Inspector: Amy Reed

Weather: Light precip
Storm Precip: 0.12 in
Last 72 hour Precip: None
Photo: ~~SS1A:2; SS1B:2~~ LA1:3; LA2:2

Outfall ID:	LA1 (one) ~~SS1A~~		LA2 (Two) ~~SS1B~~	
Flow Observed:	☑Yes	☐No	☐Yes	☑No
Description of Monitoring Site:	No flow. Standing pools of water.		Water flowing from LA1 into mini stream	
Flow Estimate (include units and method of estimation):	ϕ cfs		>0.1 cfs	
Other Observations:	Grabbed sample of standing pool of nearby water			
Color (describe):	None.		Brown	
Turbidity:	☐Clear ☑Slightly Cloudy ☐Very Cloudy ☐Opaque		☐Clear ☐Slightly Cloudy ☐Very Cloudy ☑Opaque	
Floating Solids:	☐Yes	☑No	☑Yes	☐No
Suspended Solids:	☑Yes	☐No	☑Yes	☐No
Settled Solids:	☐Yes	☑No	☐Yes	☐No ← unknown; opaque
Sheen Present:	☐Yes	☑No	☐Yes	☑No
Odor:	☐Yes	☑No	☐Yes	☑No
Foam Present:	☐Yes	☑No	☐Yes	☑No
Describe:	Standing water pools from outfall La1			

Additional Comments:

CDM Smith

Date: May 21, 2018

Event: MS4 Visual Storm Monitoring

Inspector: CDM Smith

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Los Altos Golf Course

PUERTO DEL SOL GOLF COURSE

LADERA GOLF COURSE

ARROYO DEL OSO GOLF COURSE

City of Albuquerque

Arroyo Del Oso Golf Course

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 5/21/2018
Time: 4:15 pm
Inspector: Kathryn Hayden
Signature: [signature]

Weather: Cloudy
Storm Precip: 0.46 in
Last 72 Hour Precip: Ø
Photo: See Attached

Outfall ID:	ADO1	ADO2
Flow Observed:	☒ Yes ☐ No	☒ Yes ☐ No
Description of Monitoring Site:	~~concrete~~ dirt channel east of park bridge	concrete lined channel beneath bridge
Flow Estimate (include units and method of estimation) :	>1 cfs	>1 cfs
Other Observations:	foam present	foam and some debris observed
Color (Describe):	tan / brown	tan
Turbidity:	☐ Clear ☐ Slightly Cloudy ☒ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☒ Yes ☐ No	☒ Yes ☐ No
Suspended Solids:	☒ Yes ☐ No	☒ Yes ☐ No
Settled Solids:	☒ Yes ☐ No	☐ Yes ☐ No
Sheen Present:	☐ Yes ☒ No	☐ Yes ☒ No
Odor:	☐ Yes ☒ No	☐ Yes ☐ No
Foam Present:	☒ Yes ☐ No	☒ Yes ☐ No
Describe:		

Additional Comments: NOTE: Sample wasn't collected from ADO2 for safety purposes

WESTON SOLUTIONS

Date: May 21, 2018

Event: MS4 Stormwater Visual Inspection

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Arroyo Del Oso Golf Course	
 ADO1 Flow	 ADO2 Flow
 ADO2 Sample	

FIRE DEPARTMENT MECHANIC

City of Albuquerque
Fire Department Mechanic Shop

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 5/21/18
Time: 1548
Inspector: Andrew Brenner
Signature: Andrew F Brenner

Weather: Cloudy
Storm Precip: —
Last 72 Hour Precip: no
Photo: yes

Outfall ID:	FM1	FM2
Flow Observed:	☒ Yes ☐ No	☒ Yes ☐ No
Description of Monitoring Site:	~~<1cfs~~ AFP	<1cfs AFP
Flow Estimate (include units and method of estimation) :	< 1cfs	< 1cfs
Other Observations:	—	—
Color (Describe):	yellowish tinge	yellowish tinge
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☒ Yes ☐ No	☒ Yes ☐ No
Suspended Solids:	☒ Yes ☐ No	☒ Yes ☐ No
Settled Solids:	☐ Yes ☒ No	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No	☐ Yes ☒ No
Odor:	☐ Yes ☒ No	☒ Yes ☒ No
Foam Present:	☐ Yes ☒ No	☐ Yes ☒ No
Describe:	solids appeared to be organics (leaves, etc)	solids appeared to be organics (leaves, etc)

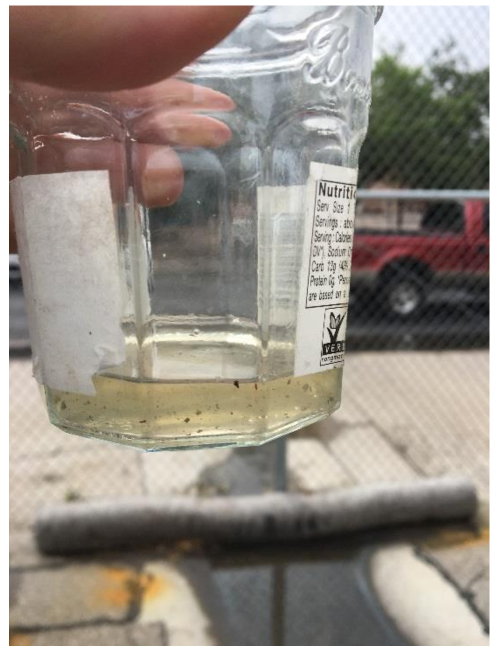
Additional Comments: ______________________________

Date: May 21, 2018

Event: MS4 Stormwater Visual Inspection

Inspector: Andrew Brenner (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Fire Mechanic	
	
	

City of Albuquerque
Fire Department Mechanic Shop

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 6/16/18
Time: 1837
Inspector: Andrew Brenner
Signature: Andrew F Brenner

Weather: cloudy + raining
Storm Precip:
Last 72 Hour Precip:
Photo: yes

Outfall ID:	FM1	FM2
Flow Observed:	☒ Yes ☐ No	☐ Yes ☐ No
Description of Monitoring Site:	flow was coming from FM1	gate was closed, unable to access site
Flow Estimate (include units and method of estimation) :	< 1 cfs	—
Other Observations:	—	—
Color (Describe):	clean	—
Turbidity:	☒ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☒ No	☐ Yes ☐ No
Settled Solids:	☐ Yes ☒ No	☐ Yes ☐ No
Sheen Present:	☐ Yes ☒ No	☐ Yes ☐ No
Odor:	☐ Yes ☒ No	☐ Yes ☐ No
Foam Present:	☐ Yes ☒ No	☐ Yes ☐ No
Describe:	—	—

Additional Comments:

WESTON SOLUTIONS

4th STREET FUELS

City of Albuquerque
4th Street Fuel Station

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 5/21/18
Time: 1634
Inspector: Andrew Brenner
Signature: Andrew F Brenner

Weather: Cloudy
Storm Precip:
Last 72 Hour Precip: no
Photo: yes

Outfall ID:	FS1
Flow Observed:	☒ Yes ☐ No
Description of Monitoring Site:	Low flow
Flow Estimate (include units and method of estimation) :	< 1cfs
Other Observations:	–
Color (Describe):	Light gray
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No
Odor:	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No
Describe:	–

Additional Comments:

WESTON SOLUTIONS

Date: May 21, 2018

Event: MS4 Stormwater Visual Inspection

Inspector: Andrew Brenner (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

4th St. Fuels	
	
	

City of Albuquerque
4th Street Fuel Station

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date:	6/16/18	Weather:	cloudy & rainy
Time:	18 ~~[illegible]~~ AFA 35	Storm Precip:	
Inspector:	Andrew Brenner	Last 72 Hour Precip:	
Signature:	Andrew F Brenner	Photo:	yes

Outfall ID:	FS1
Flow Observed:	☒ Yes ☐ No
Description of Monitoring Site:	~~wind~~ AFA Stormwater was flowing into outlet
Flow Estimate (include units and method of estimation) :	< 1cfs
Other Observations:	—
Color (Describe):	clear
Turbidity:	☒ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No
Odor:	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No
Describe:	—

Additional Comments:

WESTON SOLUTIONS

LOMAS FUELS

City of Albuquerque
Lomas Fuel Station

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☐Q2 ☐Q3 ☐Q4

Date: 5-21-2018
Time: 3:06pm
Inspector: Amy Reed

Weather: slight drizzle
Storm Precip: 0.12 in
Last 72 hour Precip: NONE
Photo: 2

Outfall ID:	**L1**
Flow Observed:	☐Yes ☑No
Description of Monitoring Site:	Alot of standing pools of water. No more flow to L1.
Flow Estimate (include units and method of estimation):	Ø cfs
Other Observations:	Used standing water sample.
Color (describe):	Tinted light brown. very faint discoloration
Turbidity:	☐Clear ☑Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☑No
Suspended Solids:	☑Yes ☐No
Settled Solids:	☐Yes ☑No
Sheen Present:	☐Yes ☑No
Odor:	☐Yes ☑No
Foam Present:	☐Yes ☑No
Describe:	Took a small sample of the standing pool of water

Additional Comments: 5' from outfall L1.

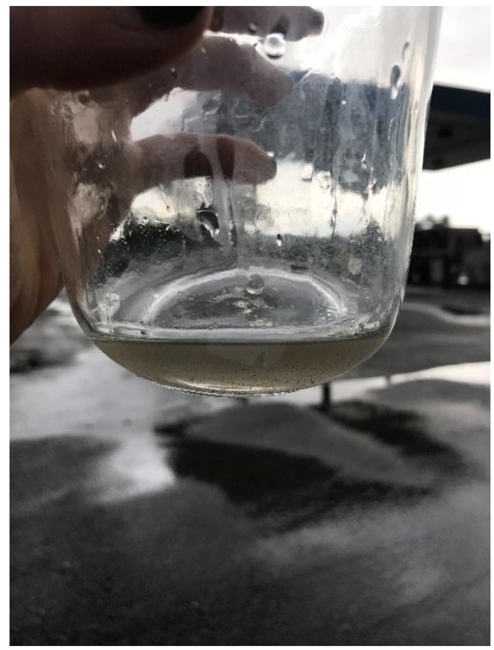
CDM Smith

Date: May 21, 2018

Event: MS4 Visual Storm Monitoring

Inspector: CDM Smith

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Lomas Fuel Station	
	

ABQ BIOPARK ZOO

City of Albuquerque
ABQ BioPark Zoo

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date:	5/21/18	Weather:	Cloudy
Time:	1527	Storm Precip:	—
Inspector:	Andrew Brenner	Last 72 Hour Precip:	no
Signature:	Andrew F Brenner	Photo:	yes

Outfall ID:	BP1
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	site was dry by the time I had arrived
Flow Estimate (include units and method of estimation) :	0
Other Observations:	—
Color (Describe):	—
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No
Odor:	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No
Describe:	—

Additional Comments: appeared to have had flow earlier

WESTON SOLUTIONS.

City of Albuquerque
ABQ BioPark Zoo

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 6/16/18
Time: 1618
Inspector: Andrew Brenner
Signature: Andrew J Brenner

Weather: cloudy & rainy
Storm Precip:
Last 72 Hour Precip:
Photo: yes

Outfall ID:	BP1
Flow Observed:	☒ Yes ☐ No
Description of Monitoring Site:	stormwater was flowing through pipe
Flow Estimate (include units and method of estimation) :	1 cfs
Other Observations:	—
Color (Describe):	brown
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☒ Opaque
Floating Solids:	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No
Odor:	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No
Describe:	—

Additional Comments:

WESTON SOLUTIONS

6TH STREET PARKS MANAGEMENT

City of Albuquerque
6th Street Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date:	5/21/18	Weather:	Cloudy
Time:	1556	Storm Precip:	—
Inspector:	Andrew Brenner	Last 72 Hour Precip:	no
Signature:	Andrew F Brenm	Photo:	yes

Outfall ID:	6PM1
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	water had ponded
Flow Estimate (include units and method of estimation) :	no flow
Other Observations:	—
Color (Describe):	Light grayish brown
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No
Odor:	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No
Describe:	—

Additional Comments: collected runoff from pond by outfall collection area

WESTON SOLUTIONS

Date: 5/21/2018

Event: Visual Monitoring

Inspector: Andrew Brenner (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

6th Street Parks Management	
	

City of Albuquerque
6th Street Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☒ Q2 ☐ Q3 ☐ Q4

Date: 6/16/18
Time: 1841
Inspector: Andrew Brenner
Signature: Andrew J Brenner

Weather: cloudy
Storm Precip:
Last 72 Hour Precip:
Photo: yes

Outfall ID:	6PM1
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	Stormwater had ponded by the time I reached the site
Flow Estimate (include units and method of estimation):	0 cfs
Other Observations:	–
Color (Describe):	Light brown
Turbidity:	☐ Clear ☐ Slightly Cloudy ☒ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No
Suspended Solids:	☒ Yes ☐ No
Settled Solids:	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No
Odor:	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No
Describe:	solid appeared to be organic

Additional Comments:

WESTON SOLUTIONS

LOS ALTOS PARKS MANAGEMENT

City of Albuquerque
Los Altos Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☑ Q2 ☐ Q3 ☐ Q4

Date: 5-21-18
Time: 3:25PM
Inspector: Amy Reed
Signature:

Weather: post-rain
Storm Precip: 0.12in
Last 72 Hour Precip: None
Photo: 3

Outfall ID:	LAP1
Flow Observed:	☑ Yes ☐ No
Description of Monitoring Site:	No employees observed working while flow was draining to LAP1.
Flow Estimate (include units and method of estimation):	>0.1cfs
Other Observations:	
Color (Describe):	light brown
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☑ Opaque
Floating Solids:	☐ Yes ☐ No → cannot see; opaque
Suspended Solids:	☑ Yes ☐ No
Settled Solids:	☐ Yes ☐ No → cannot see; opaque
Sheen Present:	☐ Yes ☑ No
Odor:	☐ Yes ☑ No
Foam Present:	☐ Yes ☑ No
Describe:	

Additional Comments:

WESTON SOLUTIONS

Date: May 21, 2018

Event: MS4 Visual Storm Monitoring

Inspector: CDM Smith

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Los Altos Park Management	
	
	

LOS ALTOS TRAILS PARKS MANAGEMENT

City of Albuquerque

Los Altos Medians Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☑ Q2 ☐ Q3 ☐ Q4

Date:	5/21/18	Weather:	Light drizzle
Time:	3:18 pm	Storm Precip:	0.12 in
Inspector:	Amy Reed	Last 72 Hour Precip:	NONE
Signature:	[signature]	Photo:	3

Outfall ID:	LAM1
Flow Observed:	☑ Yes ☐ No
Description of Monitoring Site:	Flow was being channeled into the storm drain.
Flow Estimate (include units and method of estimation) :	>0.1 cfs
Other Observations:	
Color (Describe):	Slight discoloration. See pictures.
Turbidity:	☐ Clear ☑ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☑ No
Suspended Solids:	☑ Yes ☐ No
Settled Solids:	☐ Yes ☑ No
Sheen Present:	☐ Yes ☑ No
Odor:	☐ Yes ☑ No
Foam Present:	☐ Yes ☑ No
Describe:	Sample collected as water discharged into storm drain.

Additional Comments:

WESTON SOLUTIONS

Date:	May 21, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	CDM Smith

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Los Altos Medians Park Management

MONTESSA PARK CONVENIENCE CENTER

DON RESERVIOR CONVENIENCE CENTER

EAGLE ROCK CONVENIENCE CENTER

City of Albuquerque Solid Waste Management Department

Eagle Rock Convenience Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐Q1 ☒Q2 ☐Q3 ☐Q4

Date: 6/16/2018 **Weather:** Light rain

Time: 8:39 am **Storm Precip:** 0.27

Inspector: Kathryn Hayden **Last 72 hour Precip:** Ø

*ER01/ER02 must be alternated every quarte**Photo Name:** ______

Outfall ID:	**ER02 / ER01 (circle one)**	**ER03**	ER 02
Flow Observed:	☐Yes ☐No	☐Yes ☐No	☒Yes ☐No
Description of Monitoring Site:	drain closest to building		Drain farthest from building
Flow Estimate (include units and method of estimation):	<1 cfs	<1 cfs	
Other Observations:	some large debris	~~Some deb~~	some debris
Color (describe):	Tan	Brown	Black
Turbidity:	☐Clear ☒Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☒Very Cloudy ☒Opaque	☒Opaque
Floating Solids:	☐Yes ☒No	☒Yes ☐No	☒No ☐Yes
Suspended Solids:	☒Yes ☐No	☒Yes ☐No	☐No ☒Yes
Settled Solids:	☒Yes ☐No	☒Yes ☐No	☐No ☒Yes
Sheen Present:	☒Yes ☐No	☒Yes ☐No	☒No ☐Yes
Odor:	☐Yes ☒No	☐Yes ☒No	☒No ☐Yes
Foam Present:	☐Yes ☒No	☐Yes ☒No	☒No ☐Yes
Probable sources of observed stormwater contamination, if any:	Onsite vehicles		Onsite vehicles, transfer area

Additional Comments: ______

CDM Smith

Date: 6/16/2018

Event: Visual

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Eagle Rock Convenience Center	
	

EDITH YARD

City of Albuquerque Solid Waste Management Department
Edith Yards Maintenance Facility

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☒Q2 ☐Q3 ☐Q4

Date: 5/21/2018 **Weather:** Rain/Hail
Time: 2:37 **Storm Precip:** 0.46
Inspector: Kathryn Hayden **Last 72 hour Precip:** 0
Photo Name:

Outfall ID:	**EY01**	**EY02**	**EY03**
Flow Observed:	☒Yes ☐No	☐Yes ☐No	☐Yes ☐No
Description of Monitoring Site:	Storm Drain in Parking lot		
Flow Estimate (include units and method of estimation):	>> 1cfs		
Other Observations:	Rotten egg odor		
Color (describe):	Black		
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☒Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☒No	☐Yes ☐No	☐Yes ☐No
Suspended Solids:	☒Yes ☐No	☐Yes ☐No	☐Yes ☐No
Settled Solids:	☐Yes ☒No	☐Yes ☐No	☐Yes ☐No
Sheen Present:	☒Yes ☐No	☐Yes ☐No	☐Yes ☐No
Odor:	☒Yes ☐No	☐Yes ☐No	☐Yes ☐No
Foam Present:	☒Yes ☐No	☐Yes ☐No	☐Yes ☐No
Probable sources of observed stormwater contamination, if any:	Parking lot		

Additional Comments:

CDM Smith

Date: May 21, 2018

Event: MS4 Stormwater Visual Inspection

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Edith Yards Maintenance Facility	
 EYO1 Flow	 EY01 Outfall
 EYO1 Sample	

APPENDIX B: Q2 CDM Smith Memo

6001 Indian School Road NE, Suite 310
Albuquerque, New Mexico 87110
tel: 505-243-3200
fax: 505-243-2700

July 5, 2018

Mr. Brad Sumrall, P.E.
Weston Solutions
3840 Commons Ave NE
Albuquerque, New Mexico 87109

Subject: Visual Stormwater Monitoring Report for the City of Albuquerque - Quarter 2 (Q2) 2018
(Task Order 19 Visual Monitoring)
CDM Smith Project No: 76998-224341.Q3

Dear Mr. Sumrall:

CDM Smith Inc. (CDM Smith) herein notifies Weston Solutions (Weston) that a visual stormwater monitoring event was conducted for the following City of Albuquerque facilities on May 21, 2018:

- Arroyo Maintenance
- Lomas Fuel Station
- Los Altos Golf Course
- Los Altos Parks Management
- Los Altos Trails Park Management
- Montessa Park Convenience Center
- Montessa Park Open Space
- Street Maintenance Satellite #1

Visual stormwater monitoring was not conducted for the following City of Albuquerque facilities during the second quarter (April through June) of 2018 (Q2):

- Daytona Westside Maintenance Facility
- Don Reservoir
- Ladera Golf Course
- Puerto del Sol Golf Course

- Street Maintenance Satellite #3
- Yale Transit Center

The National Weather Service (NWS) weather station, located approximately between two and eight miles from the facilities, provided precipitation information for the Q2 period (**Attachment A)**. Information included daily weather reports and other weather station data, for days when precipitation occurred on a qualifying day. The events with measurable precipitation are summarized in **Table 1**.

Section 3.2 of 2015 Multi Sector General Permit (MSGP) describes the criteria regarding the precipitation event that must be met to qualify as an assessment event. Visual assessment of stormwater must occur:

- On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and you must document why it was not possible to take the sample within the first 30 minutes.
- For storm events on discharges that occur at least 72 hours (three days) from the previous discharge.

An additional limitation on the timing of sampling activities within the City of Albuquerque is contained in the City's Storm Water Management Plan (SWMP). Section 13.3.1.2 of the SWMP limits sampling to normal business hours: Monday through Friday, 7:30 am to 5:00 pm and not required on the following observed holidays: Memorial Day; Independence Day; Labor Day; Thanksgiving Day; and Christmas Day through New Year's Day. Therefore, storm events that occur outside of normal business hours or on a holiday are not considered qualifying events.

May 21, 2018 Stormwater Inspection

A qualifying rainstorm occurred during the afternoon of May 21, 2018. A total of 0.12-inch of precipitation was measured by the local weather station, as shown on the attached NWS documentation (**Attachment A)**. Data includes NWS temperature, wind, and altimeter data. No-flow, low-flow, or moderate-flow conditions were observed at twelve outfalls observed for the eight facility sites, as shown in the photo log (**Attachment B)**. Within the preceding 72 hours of the monitoring event, no precipitation was measured at the Albuquerque International Sunport weather station.

During the May 21, 2018 qualifying event, CDM Smith mobilized to eight facilities to perform visual stormwater monitoring. Stormwater discharge flows were observed at five of the eight facilities (Arroyo Maintenance, Los Altos Golf Course, Los Altos Parks Management, Los Altos Trails Park

Management, and Street Maintenance Satellite #1). There was no evidence of excessive contamination (i.e. no foam, odor, or sheen observed) in the discharge flows from the five facilities observed under flow conditions. The absence of discharge flows at the remaining nine facilities were due to relative geolocation and lack of substantial rainfall at the sites. Photographs of the assessment are included in **Attachment B** and quarterly monitoring report forms are included in **Attachment C**.

Outfall Descriptions

Visual monitoring observations are summarized below:

- Outfall AM1 (Arroyo Maintenance) is a culvert draining from the parking lot, located on the northwest corner of the facility, discharging to Altez St. The outfall is surrounded by a waddle on the inside of the facility fence. The outfall was inspected under moderate-flow conditions. The discharging water was very cloudy and light-brown in color. The collected sample contained floating & suspended solids.

- Outfall L1 (Lomas Fuel Station) collects runoff from the City of Albuquerque fueling station, before discharging through the lowest ground elevation on the northwest of the facility premises. The outfall was inspected under no-flow conditions. A grab sample was collected from a pool of standing water in near proximity of the outfall. The sample was opaque and brown in color; and contained floating and suspended solids (SS) that appeared to be sediment and sand. The materials source can be traced to Los Altos Golf Course. The brownish color was a result of the SS.

- Outfall LA1 (Los Altos Golf Course) is a concrete culvert discharging into riprap and vegetation before entering the storm drain channel. The outfall was inspected under no-flow conditions. A grab sample was collected from the standing water at the facility outfall. The sample was slightly cloudy and contained suspended solids. Both observations resulted from sediment in the area.

- Outfall LA2 (Los Altos Golf Course) collects runoff from the Los Altos Golf Course fueling, maintenance, and storage areas before discharging through the lowest ground elevation on the west of the facility premises. The outfall was inspected under very low-flow conditions. The water had low turbidity, and SS of sediment and sand were observed in the grab sample.

- Outfall LAP1 (Los Altos Parks Management) is a 16-inch diameter concrete culvert which collects runoff from waste transfer, maintenance, and storage areas before discharging to the arroyo and storm drain channel on the west of the facility premises. The outfall was inspected under low- flow conditions. A grab sample was collected upstream from the discharge point. The collected sample was opaque & brown in appearance and contained sediment SS. The opaque characteristic indicates a high level of suspended solids in the runoff.

- Outfall LAM1 (Los Altos Trails Parks Management) is a storm drain which collects runoff from the facility parking lot area before discharging to the arroyo and storm drain channel on the northeast corner of the facility premises. The outfall was inspected under very low- flow conditions. A grab sample was collected from water discharging into the storm drain. The collected sample was slightly cloudy with a light-yellow discoloration and contained sediment SS. The yellow color can be attributed to the iron. The source likely being rusted metal storage coming in contact with the rainfall.

- Outfall MP01 (Montessa Park Convenience Center) is a lowest-elevation point on the premises which collects runoff from the waste transfer and storage areas before discharging to Los Picaros Road. The outfall was inspected under no- flow conditions, and no pooled water was present.

- Outfall MP02 (Montessa Park Convenience Center) is a lowest-elevation point on the premises which collects runoff adjacent to the tipping floor area before discharging to a storm drain trench. The outfall was inspected under no- flow conditions, and no pooled water was present.

- Outfall MP1 (Montessa Park Open Space) is a metal culvert collecting runoff from the facility parking lot and warehouse areas before discharging to the Tijeras arroyo located on the northeast of the facility premises. Outfall stormwater discharge flow was not observed, and no pooled water was present.

- Outfall MP2 (Montessa Park Open Space) is a lowest-elevation point on the premises which collects runoff from the facility parking lot and warehouse areas before discharging to the Tijeras arroyo. This outfall is located to the northwest of the facility premises. Outfall stormwater discharge flow was not observed, and no pooled water was present.

- Outfall SS1A (Street Maintenance Satellite #1) is a storm drain collecting runoff from the facility parking lots and adjacent parking areas. The outfall is surrounded by a waddle. The outfall was inspected under no- flow conditions. A grab sample was collected from a rain puddle near the outfall. The sample was very cloudy & brown in appearance and contained floating & suspended solids.

- Outfall SS1B (Street Maintenance Satellite #1) is a storm drain collecting runoff from the facility parking lots, maintenance, and storage areas. The outfall is surrounded by a waddle and was observed under very low-flow conditions. The sample was very cloudy & brown in appearance and contained floating, settled, & suspended solids.

Missed Outfall Locations

Storm events with measurable precipitation occurring during Q2 2018 are summarized in **Table 1**.

Table 1 - Q2 2018

Date	Total Precipitation (Inches)	Event Start Time	Notes
Monday, 5/21/2018	**0.12**	**2:52 PM**	**Heavy rain started at 2:52 PM. Qualifying Event.**
Sunday, 6/3/2018	0.57	3:21 PM	Heavy rain started at 3:21 PM. Non-qualifying event due to precipitation discharge outside of normal business hours.
Saturday, 6/16/2018	0.83	6:52 AM	Light rain started at 6:52 AM, light scattered showers continued until approximately 6:52 PM. Non-qualifying event due to precipitation discharge outside of normal business hours.

Table Notes: Events shaded in gray are non-qualifying events. Bold indicates qualifying events.

As seen in **Table 1**, of the three storm events with measurable precipitation that occurred in Q2, only one of the events is considered a qualifying event per the criteria listed above. During this qualifying event (May 21, 2018), CDM Smith mobilized to Montessa Park Convenience Center and Open Spaces, Lomas Fuel Station, Los Altos Golf Course, Los Altos Medians Parks Management, Los Altos Parks Management, Arroyo Maintenance, and Streets Maintenance Satellite #1. During this event, CDM Smith made the determination not to perform visual monitoring at the other facilities due to the observed lack of rainfall at the sites, based on visual storm tracking and radar data provided by weather tracking websites. Due to these circumstances a visual monitoring event was not performed during Q2 2018 at the aforementioned facilities.

Outfall Descriptions

Descriptions of the outfalls which were not monitored during Q2 2018 are summarized below:

- Outfall D1 (Daytona Westside), which collects runoff from the employee parking lot, is a storm drain manhole. Outfall stormwater discharge flow was not observed.
- Outfall D2 (Daytona Westside), which collects runoff from the bus parking lot and maintenance building areas, is a storm drain manhole. Outfall stormwater discharge flow was not observed.

- Outfall DR01 (Don Reservoir) is a concrete channel that discharges to a detention pond. This outfall collects runoff from the solid waste transfer, maintenance, and storage areas. Outfall stormwater discharge flow was not observed.
- Outfall LGC1 (Ladera Golf Course) discharges storm water from the retention pond on the north end of the golf course to the storm drain. Outfall stormwater discharge flow was not observed.
- Outfall LGC2 (Ladera Golf Course) discharges storm water collected from the maintenance and storage areas into a pond. Outfall stormwater discharge flow was not observed.
- Outfall PDS1 (Puerto del Sol Golf Course) is a storm drain inlet located on the northwest corner of the facility premises, collecting runoff from the north and northeastern portions of the golf course. Outfall stormwater discharge flow was not observed.
- Outfall PDS2 (Puerto del Sol Golf Course) is a storm drain inlet located on the eastern-central portion of the facility premises, collecting runoff from the southern portion of the golf course including maintenance, fueling, and storage areas. Outfall stormwater discharge flow was not observed.
- Outfall SS3 (Street Maintenance Satellite #3) is a concrete drainage channel discharging to a storm water retention basin, and the lowest elevation point on facility premises. The outfall is surrounded by a synthetic berm and collects runoff from the facility parking lots, maintenance, and storage areas. Outfall stormwater discharge flow was not observed. Outfall stormwater discharge flow was not observed.
- Outfall Y1 (Yale Transit Center) which collects runoff from the bus parking lot and maintenance building areas, is a grate leading to a storm drain. Outfall was observed under low-flow conditions. Outfall stormwater discharge flow was not observed.

Summary

The collected sample and observed downstream flow from outfalls AM1, LAM1, SS1A, and SS1B exhibited high sediment loads as indicated by cloudiness and discoloration with potential pollutant contamination. Facility activities in proximity to these outfalls consist primarily of vehicle and equipment maintenance which are primarily conducted under cover with little to no stormwater exposure. Therefore, the source of sediment contamination is likely to occur from spills or wash waters from solid maintenance and washing activities.

Of the observed outfalls, four were exposed to high suspended solids in the stormwater. The visual assessment revealed that for these four outfalls, stormwater was likely exposed to soil, disturbed earth, and suspended sediments. The exposure appeared to be minimal at two outfalls that had only minor cloudiness and discoloration water samples, but the other two outfalls had samples recorded as opaque.

CDM Smith appreciates the opportunity to provide environmental consulting services for Weston Solutions. Please contact CDM Smith at (505) 243-3200 with any questions or comments regarding this report.

Sincerely,

Trevin Heisey
Project Engineer
CDM Smith Inc.

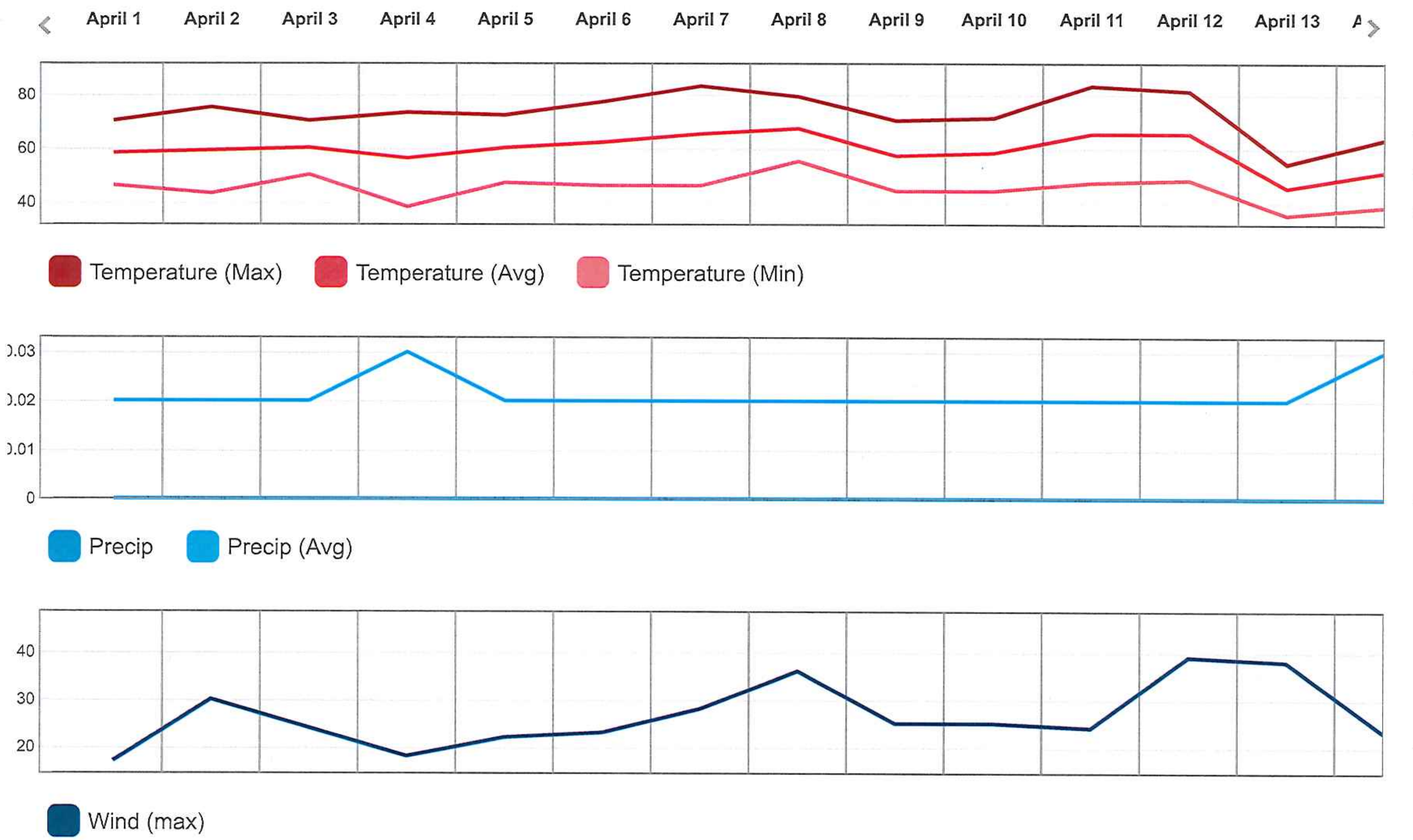
Amy Reed
Project Engineer
CDM Smith Inc.

Attachments

cc: Stormwater Database
File

ATTACHMENT A

WEATHER UNDERGROUND PRECIPITATION DATA



Summary

Temperature (° F)	Max	Average	Min	Sum
Max Temperature	83	68	57	-
Avg Temperature	74	60	46	-
Min Temperature	54	45	35	-

Temperature (° F)	Max	Average	Min	Sum

Precipitation (Inches)	Max	Average	Min	Sum
Precipitation	0	0	0	0

Dew Point (° F)	Max	Average	Min	Sum
Dew Point	43	18	-8	-

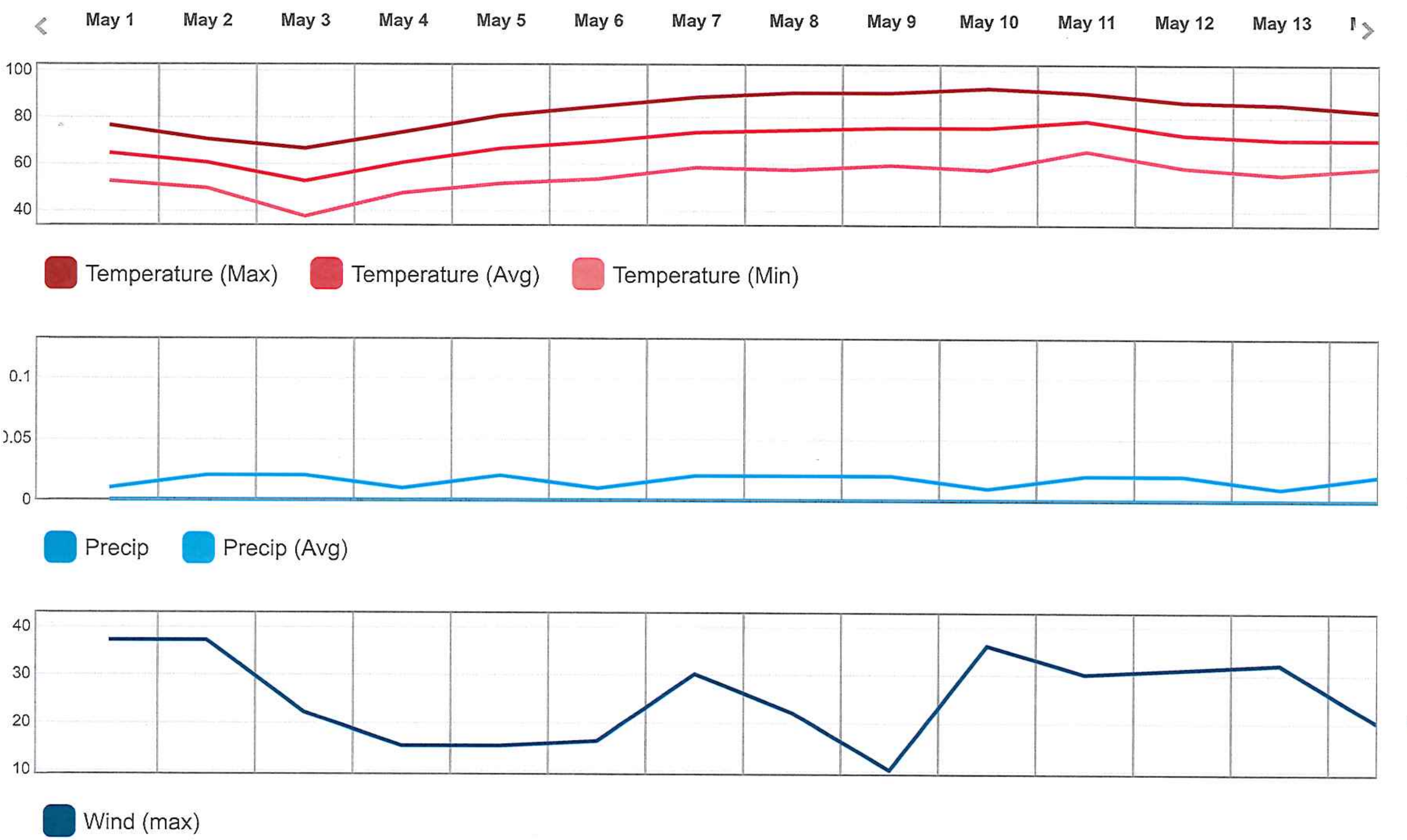
Daily Observations

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
Apr	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min
1	70	58	46	21	19	17	28	-	14	17	-	0	29.89	-	29.75	-	0.00	-
2	75	59	43	19	12	5	31	-	7	30	-	4	29.79	-	29.51	-	0.00	-
3	70	60	50	21	10	-8	24	-	5	24	-	5	29.99	-	29.58	-	0.00	-
4	73	56	38	21	16	12	37	-	13	18	-	0	30.1	-	29.84	-	0.00	-
5	72	60	47	22	18	14	24	-	12	22	-	0	30.02	-	29.79	-	0.00	-
6	77	62	46	29	24	19	34	-	16	23	-	0	29.83	-	29.62	-	0.00	-
7	83	65	46	38	32	26	45	-	18	28	-	0	29.81	-	29.58	-	0.00	-
8	79	67	55	43	27	-7	48	-	4	36	-	10	29.81	-	29.57	-	0.00	-
9	70	57	44	28	13	0	38	-	6	25	-	0	30.17	-	29.82	-	0.00	-
10	71	58	44	30	22	13	53	-	11	25	-	0	30.25	-	30.01	-	0.00	-

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
11	83	65	47	25	16	5	39	-	5	24	-	0	30	-	29.74	-	0.00	-
12	81	65	48	22	12	2	19	-	8	39	-	4	29.76	-	29.39	-	0.00	-
13	54	45	35	27	12	3	64	-	14	38	-	8	30.03	-	29.5	-	0.00	-
14	63	51	38	14	9	2	37	-	9	23	-	0	30.17	-	30	-	0.00	-
15	71	54	36	13	9	4	25	-	10	16	-	0	30.14	-	29.9	-	0.00	-
16	79	64	48	15	1	-6	19	-	4	26	-	0	29.97	-	29.74	-	0.00	-
17	78	63	47	11	4	-4	18	-	5	44	-	8	29.96	-	29.59	-	0.00	-
18	69	53	37	11	4	0	22	-	7	29	-	0	30.19	-	29.94	-	0.00	-
19	77	63	48	27	17	11	27	-	9	40	-	14	30.09	-	29.68	-	0.00	-
20	62	53	43	39	21	2	60	-	9	32	-	5	29.97	-	29.61	-	0.00	-
21	68	52	35	34	29	25	82	-	22	18	-	0	30.09	-	29.96	-	0.00	-
22	75	59	43	34	28	14	70	-	10	16	-	0	30.07	-	29.88	-	0.00	-
23	80	65	50	34	27	21	50	-	12	17	-	0	30.02	-	29.83	-	0.00	-
24	83	67	50	38	24	14	54	-	7	40	-	0	30.03	-	29.8	-	0.00	-
25	74	60	45	36	31	23	61	-	16	37	-	0	30.17	-	29.94	-	0.00	-
26	81	63	45	32	21	3	49	-	5	39	-	0	30.04	-	29.83	-	0.00	-
27	75	63	50	32	26	22	35	-	16	30	-	0	30.12	-	29.86	-	0.00	-
28	80	68	55	39	33	27	43	-	15	37	-	0	29.91	-	29.73	-	0.00	-
29	82	68	55	38	25	6	45	-	4	23	-	0	29.87	-	29.58	-	0.00	-

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)	
30	78	68	57	22	13	10	20	-	8	28	-	0	29.87	-	29.56	-	0.00	-

Site Map (/sitemap/)



Summary

Temperature (° F)	Max	Average	Min	Sum
Max Temperature	93	78	65	-
Avg Temperature	84	70	55	-
Min Temperature	66	52	37	-

Temperature (° F)	Max	Average	Min	Sum

Precipitation (Inches)	Max	Average	Min	Sum
Precipitation	0.12	0	0	0.12

Dew Point (° F)	Max	Average	Min	Sum
Dew Point	53	22	1	-

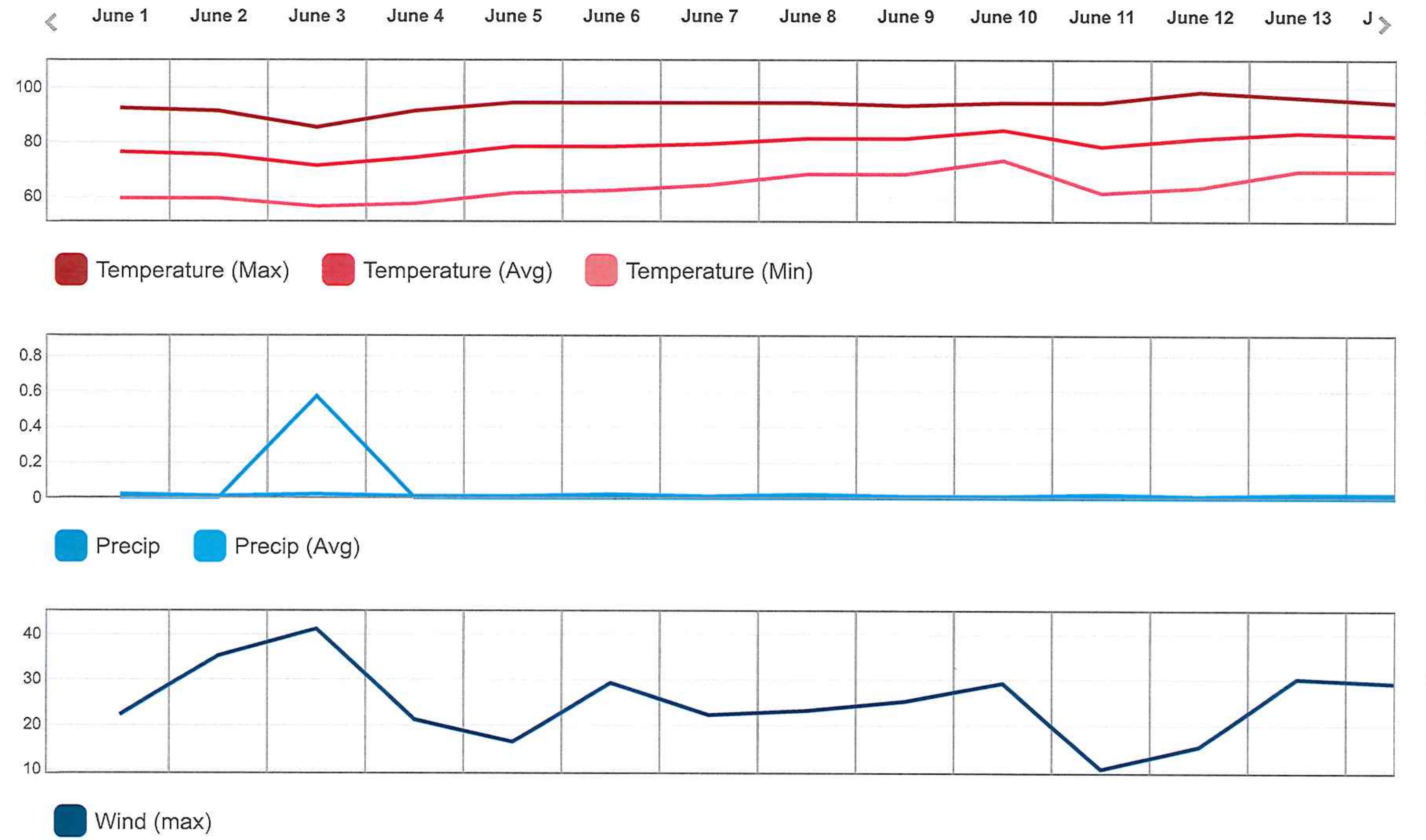
Daily Observations

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
May	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min
1	76	64	52	22	15	11	23	-	9	37	-	0	29.7	-	29.57	-	0.00	-
2	70	60	49	37	28	18	54	-	16	37	-	4	29.95	-	29.64	-	0.00	-
3	66	52	37	29	26	23	59	-	22	22	-	0	30.14	-	29.94	-	0.00	-
4	73	60	47	32	28	22	50	-	14	15	-	0	30.24	-	30.1	-	0.00	-
5	80	66	51	29	22	14	41	-	10	15	-	0	30.2	-	30.01	-	0.00	-
6	84	69	53	25	18	14	25	-	9	16	-	0	30.16	-	29.97	-	0.00	-
7	88	73	58	29	23	16	25	-	9	30	-	0	30.14	-	29.86	-	0.00	-
8	90	74	57	30	22	14	27	-	7	22	-	0	30.03	-	29.76	-	0.00	-
9	90	75	59	25	20	16	22	-	7	10	-	0	29.89	-	29.69	-	0.00	-
10	92	75	57	22	18	14	18	-	6	36	-	4	29.85	-	29.57	-	0.00	-

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
11	90	78	65	25	21	16	16	-	8	30	-	4	29.68	-	29.48	-	0.00	-
12	86	72	58	31	23	19	27	-	8	31	-	5	29.76	-	29.64	-	0.00	-
13	85	70	55	31	24	16	32	-	8	32	-	6	29.86	-	29.67	-	0.00	-
14	82	70	58	29	23	14	19	-	11	20	-	0	29.89	-	29.73	-	0.00	-
15	85	69	53	30	22	15	31	-	8	22	-	0	29.91	-	29.78	-	0.00	-
16	87	72	56	35	18	10	33	-	6	20	-	0	29.94	-	29.73	-	0.00	-
17	89	73	57	22	12	6	18	-	5	23	-	0	29.83	-	29.56	-	0.00	-
18	82	68	54	19	10	4	15	-	5	26	-	0	29.82	-	29.59	-	0.00	-
19	83	67	50	34	10	1	29	-	5	31	-	0	29.8	-	29.69	-	0.00	-
20	83	70	56	44	38	20	55	-	10	39	-	4	29.98	-	29.75	-	0.00	-
21	78	68	58	53	48	44	72	-	33	30	-	5	30.05	-	29.77	-	0.12	-
22	83	70	56	49	37	15	77	-	9	29	-	7	29.89	-	29.68	-	0.00	-
23	85	71	56	46	28	16	62	-	8	25	-	0	29.91	-	29.74	-	0.00	-
24	87	71	55	27	24	16	27	-	10	15	-	0	30.18	-	29.84	-	0.00	-
25	90	75	59	28	19	12	20	-	6	14	-	0	29.96	-	29.75	-	0.00	-
26	88	73	58	25	18	10	20	-	7	26	-	0	29.85	-	29.63	-	0.00	-
27	88	75	61	26	14	1	20	-	4	23	-	0	29.76	-	29.59	-	0.00	-
28	87	71	54	24	15	10	19	-	5	21	-	0	29.81	-	29.65	-	0.00	-
29	89	72	55	30	24	18	23	-	8	21	-	0	29.77	-	29.62	-	0.00	-

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
30	89	74	58	30	26	23	25	-	9	22	-	0	29.74	-	29.61	-	0.00	-
31	93	76	58	27	18	7	23	-	5	31	-	0	29.83	-	29.64	-	0.00	-

Site Map (/sitemap/)



Summary

Temperature (° F)	Max	Average	Min	Sum
Max Temperature	100	84	73	-
Avg Temperature	93	79	64	-
Min Temperature	74	67	56	-

Temperature (° F)	Max	Average	Min	Sum

Precipitation (Inches)	Max	Average	Min	Sum
Precipitation	0.83	0.05	0	1.4

Dew Point (° F)	Max	Average	Min	Sum
Dew Point	63	33	7	-

Daily Observations

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
Jun	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min
1	92	76	59	16	12	7	15	-	4	22	-	0	30.02	-	29.73	-	0.00	-
2	91	75	59	39	23	12	27	-	8	35	-	0	30	-	29.83	-	0.00	-
3	85	71	56	55	47	40	65	-	26	41	-	8	30.31	-	29.9	-	0.57	-
4	91	74	57	55	44	30	80	-	12	21	-	0	30.07	-	29.78	-	0.00	-
5	94	78	61	43	28	18	43	-	7	16	-	0	29.89	-	29.67	-	0.00	-
6	94	78	62	36	31	22	25	-	10	29	-	0	29.97	-	29.69	-	0.00	-
7	94	79	64	37	31	25	32	-	8	22	-	0	29.86	-	29.73	-	0.00	-
8	94	81	68	37	30	19	32	-	8	23	-	0	29.92	-	29.79	-	0.00	-
9	93	81	68	49	38	32	47	-	13	25	-	0	29.92	-	29.72	-	0.00	-
10	94	84	73	42	27	9	27	-	4	29	-	5	29.78	-	29.57	-	0.00	-

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			Pressure (Hg)			Precipation (in)		
11	94	78	61	26	20	11	16	-	7	10	-	0	29.78	-	29.65	-	0.00	-
12	98	81	63	31	21	12	22	-	5	15	-	0	29.83	-	29.66	-	0.00	-
13	96	83	69	51	35	13	44	-	8	30	-	4	29.87	-	29.71	-	0.00	-
14	94	82	69	43	41	38	37	-	15	29	-	0	29.86	-	29.7	-	0.00	-
15	92	80	67	47	42	37	39	-	15	33	-	0	29.77	-	29.59	-	0.00	-
16	74	67	60	63	59	53	97	-	53	30	-	0	29.97	-	29.63	-	0.83	-
17	81	72	62	61	51	44	87	-	28	17	-	4	29.88	-	29.76	-	0.00	-
18	87	75	62	47	44	41	56	-	21	17	-	0	29.93	-	29.76	-	0.00	-
19	93	79	64	46	32	16	41	-	8	21	-	0	29.85	-	29.68	-	0.00	-
20	94	78	62	44	29	23	38	-	8	23	-	0	29.88	-	29.73	-	0.00	-
21	95	82	68	57	41	30	57	-	12	24	-	0	29.92	-	29.74	-	0.00	-
22	100	84	68	46	30	17	38	-	6	28	-	5	29.79	-	29.55	-	0.00	-
23	98	82	65	27	19	12	19	-	6	25	-	0	29.9	-	29.55	-	0.00	-
24	97	82	67	38	28	18	26	-	8	24	-	4	29.72	-	29.61	-	0.00	-
25	92	79	66	54	36	19	57	-	11	25	-	4	29.89	-	29.72	-	0.00	-
26	99	83	67	41	30	19	35	-	6	15	-	0	29.89	-	29.71	-	0.00	-
27	100	84	70	38	29	21	29	-	4	14	-	0	29.86	-	29.69	-	0.00	-
28	93	80	68	35	32	23	28	-	5	12	-	0	29.8	-	29.71	-	0.00	-

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Weather observations for the past three days

Albuquerque, Albuquerque International Airport

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metric en español

Date	Time (mdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Temperature (°F)				Relative Humidity	Wind Chill (°F)	Heat Index (°F)	Pressure		Precipitation (in.)		
						Air	Dwpt	6 hour Max.	6 hour Min.				altimeter (in)	sea level (mb)	1 hr	3 hr	6 hr
21	17:52	E 20 G 25	10.00	Overcast	FEW080 SCT110 BKN150 OVC250	70	45	78	63	41%	NA	NA	29.98	1008.5			0.12
21	16:52	E 29 G 37	10.00	Overcast and Windy	BKN100 BKN130 OVC220	70	48			46%	NA	NA	30.00	1009.1			
21	15:52	SE 9	10.00	Overcast	BKN095 BKN110 OVC140	71	47			42%	NA	NA	30.02	1009.5			
21	14:52	N 16 G 26	10.00	Thunderstorm Light Rain	SCT075CB BKN095 OVC110	63	51			65%	NA	NA	30.04	1011.2	0.12	0.12	
21	13:52	E 16 G 24	10.00	Overcast	BKN085 OVC160	76	45			33%	NA	77	29.99	1007.9			
21	12:52	E 12	10.00	Mostly Cloudy	SCT070 BKN190	76	45			33%	NA	77	30.04	1009.2			
21	11:52	S 13 G 21	10.00	Mostly Cloudy	FEW070 BKN270	77	46	77	61	33%	NA	78	30.06	1009.9			
21	10:52	SE 13 G 21	10.00	Partly Cloudy	FEW060 SCT270	73	47			40%	NA	NA	30.09	1011.4			
21	09:52	SE 18	10.00	Mostly Cloudy	FEW035 FEW045 BKN270	70	49			47%	NA	NA	30.10	1012.0			
21	08:52	E 23 G 30	10.00	Overcast and Breezy	FEW035 OVC270	66	49			54%	NA	NA	30.11	1012.2			
21	07:52	E 22 G 28	10.00	Overcast and Breezy	FEW020 FEW035 SCT200 OVC270	63	49			60%	NA	NA	30.09	1011.8			
21	06:52	E 17	10.00	Overcast	FEW015 FEW035 OVC270	62	49			62%	NA	NA	30.08	1010.7			
21	05:52	E 18	10.00	A Few Clouds	FEW030 FEW270	61	49	69	61	65%	NA	NA	30.07	1010.3			
21	04:52	E 17	10.00	A Few Clouds	FEW020 FEW040	63	48			60%	NA	NA	30.07	1010.5			
21	03:52	E 17	10.00	A Few Clouds	FEW050 FEW220	63	47			56%	NA	NA	30.07	1010.4			
21	02:52	E 8	10.00	Partly Cloudy	FEW055 FEW130 SCT230	63	47			56%	NA	NA	30.06	1010.0			
21	01:52	E 16 G 21	10.00	Partly Cloudy	FEW055 FEW130 SCT230	64	45			50%	NA	NA	30.05	1009.9			

21	00:52	E 14	10.00	Partly Cloudy	FEW130 SCT250	67	44			44%	NA	NA	30.05	1009.9
20	23:52	E 18 G 26	10.00	Mostly Cloudy	BKN250	69	43	83	68	39%	NA	NA	30.04	1009.7
20	22:52	E 21	10.00	Partly Cloudy and Breezy	SCT250	69	44			41%	NA	NA	30.04	1009.9
20	21:52	E 24 G 33	10.00	A Few Clouds and Breezy	FEW250	70	43			38%	NA	NA	30.02	1009.4
20	20:52	E 25 G 37	10.00	A Few Clouds and Breezy	FEW140 FEW250	72	41			33%	NA	NA	30.00	1008.7
20	19:52	E 18 G 26	10.00	Partly Cloudy	FEW130 SCT160 SCT220	75	39			27%	NA	NA	29.98	1008.1
20	18:52	S 16 G 28	10.00	Partly Cloudy	SCT130 SCT160 SCT250	82	20			10%	NA	80	29.97	1007.4
20	17:52	SW 13 G 23	10.00	Partly Cloudy	SCT130 SCT250	82	25	83	69	12%	NA	80	29.97	1007.5
20	16:52	S 10 G 21	10.00	Partly Cloudy	FEW100 SCT140 SCT250	81	27			14%	NA	79	29.99	1008.0
20	15:52	Vrbl 3	10.00	Partly Cloudy	FEW080 SCT110 SCT250	79	29			16%	NA	78	30.02	1009.3
20	14:52	SW 8	10.00	A Few Clouds	FEW070 FEW100 FEW300	79	35			20%	NA	78	30.06	1010.6
20	13:52	SE 8	10.00	A Few Clouds	FEW070 FEW300	75	38			26%	NA	NA	30.09	1011.6
20	12:52	E 6	10.00	A Few Clouds	FEW070	73	39			29%	NA	NA	30.12	1012.7
20	11:52	SE 8 G 21	10.00	A Few Clouds	FEW040 FEW060 FEW300	70	40	70	56	34%	NA	NA	30.15	1013.6
20	10:52	E 15	10.00	A Few Clouds	FEW040 FEW050 FEW300	67	41			39%	NA	NA	30.17	1014.4
20	09:52	E 21 G 31	10.00	A Few Clouds and Breezy	FEW040	64	41			43%	NA	NA	30.17	1014.7
20	08:52	E 24 G 31	10.00	A Few Clouds and Breezy	FEW040	62	41			46%	NA	NA	30.16	1014.2
20	07:52	E 24 G 37	10.00	A Few Clouds and Breezy	FEW035	59	41			51%	NA	NA	30.14	1013.5
20	06:52	E 32 G 43	10.00	A Few Clouds and Windy	FEW035	56	40			55%	NA	NA	30.10	1012.4
20	05:52	E 29 G 37	10.00	A Few Clouds and Windy	FEW040	56	40	67	56	55%	NA	NA	30.09	1011.7
20	04:52	E 33 G 45	10.00	Fair and Windy	CLR	57	40			53%	NA	NA	30.05	1010.4

20	03:52	E 32 G 45	10.00	A Few Clouds and Windy	FEW030	58	40			51%	NA	NA	30.02	1009.4
20	02:52	E 31 G 43	10.00	A Few Clouds and Windy	FEW030 FEW200	59	40			49%	NA	NA	30.01	1008.9
20	01:52	E 29 G 37	10.00	A Few Clouds and Windy	FEW130	63	39			41%	NA	NA	29.99	1007.9
20	00:52	E 23 G 32	10.00	A Few Clouds and Breezy	FEW100	65	37			36%	NA	NA	29.99	1007.3
19	23:52	E 21 G 31	10.00	A Few Clouds and Breezy	FEW100	67	34	81	67	30%	NA	NA	29.98	1007.4
19	22:52	E 30 G 37	10.00	Fair and Windy	CLR	70	17			13%	NA	NA	29.97	1006.9
19	21:52	E 8	10.00	A Few Clouds	FEW090	69	7			9%	NA	NA	29.95	1007.0
19	20:52	E 7	10.00	A Few Clouds	FEW090 FEW300	73	7			7%	NA	NA	29.93	1006.1
19	19:52	S 6	10.00	Partly Cloudy	FEW090 FEW180 SCT300	79	8			6%	NA	77	29.91	1005.3
19	18:52	SW 3	10.00	A Few Clouds	FEW090 FEW180	80	9			6%	NA	78	29.91	1005.6
19	17:52	S 12 G 17	10.00	A Few Clouds	FEW090 FEW180	80	7	83	75	6%	NA	78	29.91	1005.9
19	16:52	S 7	10.00	A Few Clouds	FEW090 FEW180	80	1			4%	NA	78	29.92	1006.0
19	15:52	Vrbl 3	10.00	A Few Clouds	FEW090 FEW180	80	9			6%	NA	78	29.94	1007.1
19	14:52	Vrbl 3	10.00	A Few Clouds	FEW080	79	9			7%	NA	77	29.96	1007.1
19	13:52	W 7	10.00	A Few Clouds	FEW080	79	10			7%	NA	77	29.97	1007.6
19	12:52	Vrbl 5	10.00	A Few Clouds	FEW070	80	12			7%	NA	78	29.99	1007.0
19	11:52	Vrbl 3	10.00	A Few Clouds	FEW070 FEW200	77	13	77	50	9%	NA	76	30.00	1008.0
19	10:52	Calm	10.00	A Few Clouds	FEW090 FEW200	73	14			10%	NA	NA	30.01	1008.3
19	09:52	SW 3	10.00	A Few Clouds	FEW070 FEW180	67	14			13%	NA	NA	30.01	1008.8
19	08:52	Calm	10.00	A Few Clouds	FEW180	62	14			15%	NA	NA	30.01	1008.9
19	07:52	SW 6	10.00	A Few Clouds	FEW120	60	11			14%	NA	NA	30.00	1008.5
19	06:52	E 7	10.00	Fair	CLR	53	7			15%	NA	NA	29.98	1008.3
19	05:52	SE 7	10.00	Fair	CLR	52	4	68	50	14%	NA	NA	29.97	1008.0
19	04:52	Vrbl 3	10.00	Fair	CLR	54	4			13%	NA	NA	29.96	1007.6
19	03:52	SE 6	10.00	Fair	CLR	52	4			14%	NA	NA	29.95	1007.5
19	02:52	S 7	10.00	Fair	CLR	57	7			13%	NA	NA	29.94	1006.5
19	01:52	SE 6	10.00	Fair	CLR	56	5			13%	NA	NA	29.93	1006.2
19	00:52	N 3	10.00	Fair	CLR	67	5			8%	NA	NA	29.92	1005.2

18	23:52	NE 7	10.00	Fair	CLR	67	6	81	66	9%	NA	NA	29.91	1005.0			
18	22:52	NW 8	10.00	Fair	CLR	70	5			8%	NA	NA	29.89	1004.3			
18	21:52	NW 8	10.00	A Few Clouds	FEW170	71	5			7%	NA	NA	29.87	1003.7			
18	20:52	W 8	10.00	A Few Clouds	FEW170	73	8			8%	NA	NA	29.85	1003.0			
18	19:52	NW 9	10.00	Partly Cloudy	FEW170 SCT200	77	9			7%	NA	76	29.83	1002.4			
18	18:52	W 17	10.00	Mostly Cloudy	SCT150 BKN200	80	4			5%	NA	78	29.81	1002.0			
Date	**Time (mdt)**	**Wind (mph)**	**Vis. (mi.)**	**Weather**	**Sky Cond.**	**Air**	**Dwpt**	**Max. 6 hour**	**Min. 6 hour**	**Relative Humidity**	**Wind Chill (°F)**	**Heat Index (°F)**	**altimeter (in.)**	**sea level (mb)**	**1 hr**	**3 hr**	**6 hr**
						Temperature (°F)							**Pressure**		**Precipitation (in.)**		

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Southern Region Headquarters
Fort Worth, Texas
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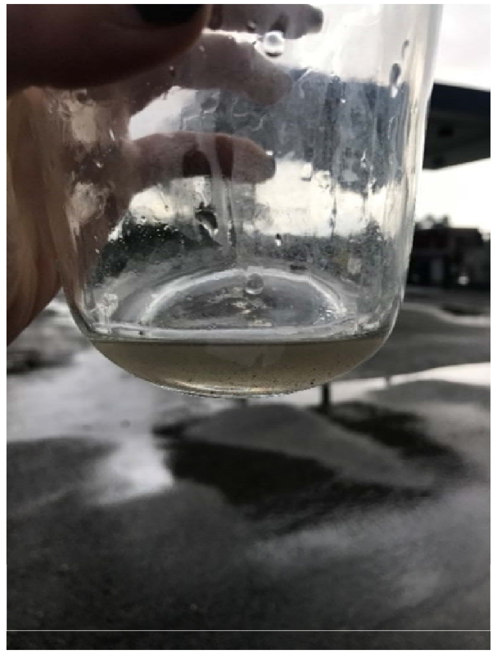
ATTACHMENT B

PHOTOGRAPHS

May 21, 2018
Stormwater Monitoring Photographs
City of Albuquerque Facilities

Photograph 1: Outfall AM1.



Photograph 2: Outfall L1.

Photograph 3: Outfall LA1.

Photograph 4: Outfall LA2.

May 21, 2018
Stormwater Monitoring Photographs
City of Albuquerque Facilities

Photograph 5: Outfall LAP1.

Photograph 6: Outfall LAM1.

Photograph 7: Outfall MP01.

Photograph 8: Outfall MP02.

May 21, 2018
Stormwater Monitoring Photographs
City of Albuquerque Facilities

Photograph 9: Outfall MP1.

NO PICTURE

Photograph 10: Outfall MP2.

Photograph 11: Outfall SS1A.

Photograph 12: Outfall SS1B.

ATTACHMENT C

MONITORING REPORT FORMS

City of Albuquerque
Storm Drainage Maintenance Arroyo Maintenance Section

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☑Q2 ☐Q3 ☐Q4

Date: 5-21-18
Time: 4:55pm
Inspector: Amy Reed

Weather: post-precipitation
Storm Precip: 0.12in
Last 72 hour Precip: NONE
Photo: 3

Outfall ID:	**AM1**	
Flow Observed:	☑Yes	☐No
Description of Monitoring Site:	Water draining down concrete culvert at steep grate to outfall AM1	
Flow Estimate (include units and method of estimation):	>0.1cfs	
Other Observations:		
Color (describe):	Tinted light Brown	
Turbidity:	☐Clear ☐Slightly Cloudy ☑Very Cloudy ☐Opaque	
Floating Solids:	☑Yes	☐No
Suspended Solids:	☑Yes	☐No
Settled Solids:	☐Yes	☑No
Sheen Present:	☐Yes	☑No
Odor:	☐Yes	☑No
Foam Present:	☐Yes	☑No
Describe:		

Additional Comments: ______

City of Albuquerque

Lomas Fuel Station

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐Q1 ☐Q2 ☐Q3 ☐Q4

Date:	5-21-2018	**Weather:**	slight drizzle
Time:	3:06pm	**Storm Precip:**	0.12 in
Inspector:	Amy Reed	**Last 72 hour Precip:**	NONE
		Photo:	2

Outfall ID:	**L1**	
Flow Observed:	☐Yes	☑No
Description of Monitoring Site:	A lot of standing pools of water. No more flow to L1.	
Flow Estimate (include units and method of estimation):	Ø cfs	
Other Observations:	Used standing water sample.	
Color (describe):	Tinted light brown. Very faint discoloration	
Turbidity:	☐Clear ☑Slightly Cloudy ☐Very Cloudy ☐Opaque	
Floating Solids:	☐Yes	☑No
Suspended Solids:	☑Yes	☐No
Settled Solids:	☐Yes	☑No
Sheen Present:	☐Yes	☑No
Odor:	☐Yes	☑No
Foam Present:	☐Yes	☑No
Describe:	Took a small sample of the standing pool of water	

Additional Comments: 5' from outfall L1.

CDM Smith

City of Albuquerque
~~Street Maintenance Satellite #1~~
Los Altos Golf Course
Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☑Q2 ☐Q3 ☐Q4

Date: 5-21-18 Weather: Light precip
Time: 3:07pm Storm Precip: 0.12 in
Inspector: Amy Reed Last 72 hour Precip: None
Photo: ~~SS1A:2; SS1B:2~~ LA1:3; LA2:2

Outfall ID:	LA1 (one) ~~SS1A~~	LA2 (Two) ~~SS1B~~
Flow Observed:	☑Yes ☐No	☐Yes ☑No
Description of Monitoring Site:	No flow. Standing pools of water.	Water flowing from LA1 into mini stream
Flow Estimate (include units and method of estimation):	φ cfs	>0.1 cfs
Other Observations:	Grabbed sample of standing pool of nearby water	
Color (describe):	None.	Brown
Turbidity:	☐Clear ☑Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☑Opaque
Floating Solids:	☐Yes ☑No	☑Yes ☐No
Suspended Solids:	☑Yes ☐No	☑Yes ☐No
Settled Solids:	☐Yes ☑No	☐Yes ☐No ← unknown; opaque
Sheen Present:	☐Yes ☑No	☐Yes ☑No
Odor:	☐Yes ☑No	☐Yes ☑No
Foam Present:	☐Yes ☑No	☐Yes ☑No
Describe:	Standing water pools from outfall LA1	

Additional Comments:

CDM Smith

City of Albuquerque
Los Altos Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☑ Q2 ☐ Q3 ☐ Q4

Date: 5-21-18
Time: 3:25PM
Inspector: Amy Reed
Signature:

Weather: post-rain
Storm Precip: 0.12in
Last 72 Hour Precip: NoNE
Photo: 3

Outfall ID:	LAP1
Flow Observed:	☑ Yes ☐ No
Description of Monitoring Site:	No employees observed working while flow was draining to LAP1.
Flow Estimate (include units and method of estimation):	>0.1cfs
Other Observations:	
Color (Describe):	light brown
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ ~~Very Cloudy~~ ☑ Opaque
Floating Solids:	☐ Yes ☐ No → cannot see; opaque
Suspended Solids:	☑ Yes ☐ No
Settled Solids:	☐ Yes ☐ No → cannot see; opaque
Sheen Present:	☐ Yes ☑ No
Odor:	☐ Yes ☑ No
Foam Present:	☐ Yes ☑ No
Describe:	

Additional Comments:

WESTON SOLUTIONS

City of Albuquerque

Los Altos Medians Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☑ Q2 ☐ Q3 ☐ Q4

Date:	5/21/18	Weather:	Light drizzle
Time:	3:18 pm	Storm Precip:	0.12 in
Inspector:	Amy Reed	Last 72 Hour Precip:	NONE
Signature:		Photo:	3

Outfall ID:	LAM1
Flow Observed:	☑ Yes ☐ No
Description of Monitoring Site:	Flow was being channeled into the storm Drain.
Flow Estimate (include units and method of estimation) :	>0.1 cfs
Other Observations:	
Color (Describe):	Slight discoloration. See pictures.
Turbidity:	☐ Clear ☑ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☑ No
Suspended Solids:	☑ Yes ☐ No
Settled Solids:	☐ Yes ☑ No
Sheen Present:	☐ Yes ☑ No
Odor:	☐ Yes ☑ No
Foam Present:	☐ Yes ☑ No
Describe:	Sample collected as water discharged into storm drain.

Additional Comments:

WESTON SOLUTIONS

City of Albuquerque Solid Waste Management Department
Montessa Park Convenience Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☒Q2 ☐Q3 ☐Q4

Date:	5/21/18	**Weather:**	Overcast
Time:	3:40pm	**Storm Precip:**	0.12-in
Inspector:	T. Heiser	**Last 72 hour Precip:**	0.00-in
		Photo Name:	—

Outfall ID:	**MP01**	**MP02**
Flow Observed:	☐Yes ☒No	☐Yes ☒No
Description of Monitoring Site:		
Flow Estimate (include units and method of estimation):	—	—
Other Observations:	N/A	N/A
Color (describe):	N/A	N/A
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque N/A	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque N/A
Floating Solids:	☐Yes ☒No	☐Yes ☒No
Suspended Solids:	☐Yes ☒No	☐Yes ☒No
Settled Solids:	☐Yes ☒No	☐Yes ☒No
Sheen Present:	☐Yes ☒No	☐Yes ☒No
Odor:	☐Yes ☒No	☐Yes ☒No
Foam Present:	☐Yes ☒No	☐Yes ☒No
Probable sources of observed stormwater contamination, if any:		

Additional Comments: ____________________

CDM Smith

City of Albuquerque
Montessa Park Open Space

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☒Q2 ☐Q3 ☐Q4

Date: 5/21/18 **Weather:** Overcast
Time: 3:50 **Storm Precip:** 0.12-in
Inspector: T. Heisey **Last 72 hour Precip:** 0.00-in
Photo: Yes for MP1 No for MP2

Outfall ID:	MP1	MP2
Flow Observed:	☐Yes ☒No	☐Yes ☒No
Description of Monitoring Site:	N/A	N/A
Flow Estimate (include units and method of estimation):		
Other Observations:		
Color (describe):		
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No	☐Yes ☐No
Suspended Solids:	☐Yes ☐No	☐Yes ☐No
Settled Solids:	☐Yes ☐No	☐Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☐No
Odor:	☐Yes ☐No	☐Yes ☐No
Foam Present:	☐Yes ☐No	☐Yes ☐No
Describe:		

Additional Comments:

CDM Smith

City of Albuquerque
Street Maintenance Satellite #1

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☐Q1 ☑Q2 ☐Q3 ☐Q4

Date: 5/21/18 **Weather:** post precipitation
Time: 3:34 **Storm Precip:** 0.12in
Inspector: Amy Reed **Last 72 hour Precip:** NONE
Photo: SS1A:3, SS1B:3

Outfall ID:	**SS1A**	**SS1B**
Flow Observed:	☐Yes ☑No	☑Yes ☐No
Description of Monitoring Site:	No flow to drain. minor standing water puddles nearby.	Flow to drain buffered by a berm. standing water around drain
Flow Estimate (include units and method of estimation):	Ø cfs	<0.1cfs
Other Observations:	No employees in the vicinity. No maintenance or vehicle fueling observed. No spills/stains	
Color (describe):	slight tint of brown	slight tint of BROWN
Turbidity:	☐Clear ☐Slightly Cloudy ☑Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☑Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☑No	☐Yes ☑No
Suspended Solids:	☑Yes ☐No	☑Yes ☐No
Settled Solids:	☑Yes ☐No	☑Yes ☐No
Sheen Present:	☐Yes ☑No	☐Yes ☑No
Odor:	☐Yes ☑No	☐Yes ☑No
Foam Present:	☐Yes ☑No	☐Yes ☑No
Describe:	Took a sample of nearby standing water puddles	pulled from water by storm drain berm

Additional Comments: sediment seems more gritty and darker than at SS1B.

CDM Smith

Weston Solutions, Inc.
3840 Commons Ave. NE
Albuquerque, NM 87109
505-837-6520 Fax 505-837-6595
www.westonsolutions.com

April 13, 2018

Ms. Kathy Verhage, P.E.
Department of Municipal Development - Storm Drainage Design
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Reference: PROJECT NO. 8010 CITYWIDE ON-CALL NPDES AND MS4 ENGINEERING SUPPORT SERVICES 1st QUARTER 2018 UPDATE FOR TASK 19 VISUAL STORM WATER INSPECTIONS

Dear Ms. Verhage:

This Memo describes the results of the 2018 Quarter 1 Visual Storm Water Inspections for 24 City of Albuquerque (City) facilities. This evaluation and memo has been prepared to address the requirements of the U.S. Environmental Protection Agency's (EPA) Municipal Separate Storm Sewer System (MS4) Permit issued to the City in 2014 and the Multi Sector General Permit for Storm Water Discharges Associated with Industrial Activity (MSGP) at City-owned facilities. The purpose of this memo is to document the City's compliance with the requirements relative to quarterly stormwater monitoring.

To comply with the MS4 and MSGP's requirements for stormwater monitoring, the City has tasked Weston Solutions and CDM Smith with performing quarterly visual stormwater monitoring at 24 City-owned facilities which meet the definition of an industrial facility in the MSGP based on audits of City-owned facilities performed between 2012 and 2018. The following facilities are monitored using visual inspection methods to identify potential impacted stormwater discharges. Locations of these facilities are shown in Figure 1 with additional detail information provided in Table 1. Several facilities were not inspected during the first quarter as few qualifying storm events occurred during the quarter. The facility list and status of monitoring are shown below.

- Arroyo Del Oso Golf Course (Visited, samples collected at one outfall)
- Storm Drainage Maintenance Arroyo Maintenance Section (Visited, samples collected at one outfall)
- Balloon Fiesta Park and Golf Training Center (Not monitored)
- Albuquerque BioPark Zoo (Visited, sample not collected)
- West Side Maintenance Facility (Daytona) (Visited, sample not collected)
- Fire Department Mechanic Shop (Visited, samples collected at two outfall)
- 4th Street Fuel Station (Visited, samples collected at one outfall)
- Lomas Fuel Station (Visited, samples collected at one outfall)
- Ladera Golf Course (Visited, sample not collected)
- Los Altos Golf Course (Visited, samples collected at one outfall)
- Montessa Park Open Space (Visited, sample not collected)
- Pino Yards Complex (Visited, samples collected at one outfall)
- Puerto del Sol Golf Course (Visited, sample not collected)
- Streets Maintenance Satellite #1 (Visited, samples collected at one outfall)
- Street Maintenance Satellite #2 (Visited, samples collected at one outfall)
- Street Maintenance Satellite #3 (Visited, sample not collected)
- Yale Maintenance Facility (Visited, samples collected at one outfall)
- 6th Street Park Management (Visited, samples collected at one outfall)
- Los Altos Park Management (Visited, sample not collected)
- Los Altos Medians Park Management (Visited, sample not collected)
- Montessa Park Convenience Center (Visited, samples collected at two outfall)

- Don Reservoir Convenience Center (Visited, sample not collected)
- Eagle Rock Convenience Center (Visited, samples collected at one outfall)
- Edith Yards Maintenance Facility (Visited, sample not collected)

Figure 1 shows the outfall identification names along with the inspection team responsible for monitoring the particular outfall.

April 13, 2018

Figure 1: Facility Site Locations

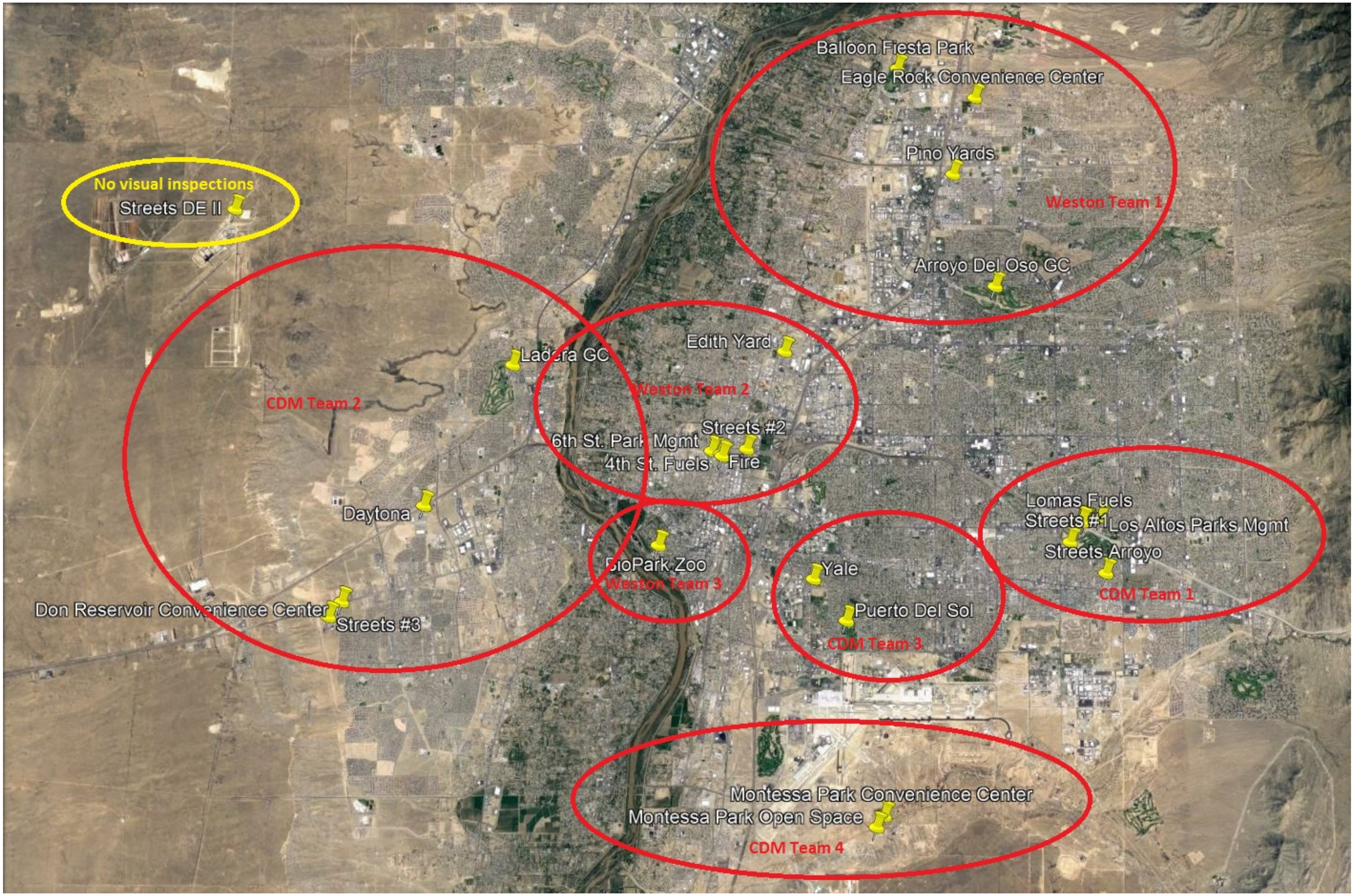


Table 1: Outfall ID and Designees

Site	Outfall ID	2018 Q1 Status
Weston 1		
Balloon Fiesta Park and Golf Training Center	BFP1	Not Monitored
	BFP2	Not Monitored
	BFP3	Not Monitored
	BFP4	Not Monitored
	BFP5	Not Monitored
Pino Yards Complex	PY1	Visited, dry – no sample
	PY2	Visited, dry – no sample
	PY3	Visited, sample collected
Arroyo Del Oso Golf Course	ADO1	Visited, dry – no sample
	ADO2	Visited, sample collected
Eagle Rock Convenience Center	ER01	Visited, dry – no sample
	ER02	Visited, dry – no sample
	ER03	Visited, sample collected
Weston 2		
4th Street Fuel Station	FS1	Visited, sample collected
Fire Department Mechanic Shop	FM1	Visited, sample collected
	FM2	Visited, sample collected
Street Maintenance Satellite #2	SS2	Visited, sample collected
Edith Yards Maintenance Facility	EY01	Visited, dry – no sample
	EY02	Visited, dry – no sample
	EY03	Visited, dry – no sample
6th Street Park Management	6PM1	Visited, sample collected
CDM Smith 1		
Los Altos Golf Course	LA1	Visited, dry – no sample
	LA2	Visited, sample collected
Lomas Fuel Station	L1	Visited, sample collected
Storm Drainage Maintenance Arroyo Maintenance Section	AM1	Visited, sample collected
Street Maintenance Satellite #1	SS1A	Visited, dry – no sample
	SS1B	Visited, sample collected
Los Altos Park Management	LAP1	Visited, dry – no sample
Los Altos Medians Park Management	LAM1	Visited, dry – no sample
CDM Smith 2		
West Side Maintenance Facility (Daytona)	D1	Visited, dry – no sample
	D2	Visited, dry – no sample
Ladera Golf Course	LGC1	Visited, dry – no sample
	LGC2	Visited, dry – no sample
Street Maintenance Satellite #3	SS3	Visited, dry – no sample
Don Reservoir Convenience Center	DR01	Visited, dry – no sample
CDM Smith 3		
Puerto Del Sol Golf Course	PDS1	Visited, dry – no sample
	PDS2	Visited, dry – no sample

Site	Outfall ID	2018 Q1 Status
Yale Maintenance Facility	Y1	Visited, sample collected
CDM Smith 4		
Montessa Park Open Space	MP1	Visited, dry – no sample
	MP2	Visited, dry – no sample
Montessa Park Convenience Center	MP01	Visited, sample collected
	MP02	Visited, sample collected
Weston 3		
ABQ BioPark Zoo	BP1	Visited, dry – no sample

Background

The MSGP establishes requirements for monitoring the quality of stormwater discharges depending on the nature of activities performed at the various industrial facilities. Although benchmark monitoring is not required, the MSGP does require quarterly visual assessment of stormwater quality. Visual assessment consists of the collection of grab samples from each outfall (subject to demonstration of substantially identical outfalls) and examination for the presence of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other indicators of stormwater pollution.

Certain criteria regarding the precipitation event must be met for an assessment event. Visual assessment of stormwater must occur:

- During daylight hours
- Within 30 minutes of start of storm water discharge (or as soon as practicable thereafter)
- At least 72 hours after the previous storm water discharge event

Weston follows the City's existing stormwater monitoring protocol outlining the locations and descriptions of all outfalls to be monitored. The protocol identifies contact persons at each facility for use in notifying City personnel when members of the stormwater monitoring team are mobilizing to that location. A standard visual assessment form is used by all staff to document the monitoring activities.

Quarter 1 Monitoring Results

The 1st Quarter sampling period ran from January 1 to March 31, 2018. Albuquerque was unusually dry during the sampling period, with only one storm occurring during the first week of October.

- Weston Sites Group 1 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 3 out of 13 outfalls over the course of the 1 mobilization. One sample was collected from each of the following facilities: Pino Yards, Arroyo del Oso Golf Course and the Eagle Rock Convenience Center.
- Weston Sites Group 2 mobilized 2 times during the quarter to collect samples from storm events. Visual samples were collected from 5 out of 8 outfalls over the course of the 2 mobilizations. No samples were collected from Edith Yard.
- Weston Sites Group 3 (BioPark) mobilized 2 times during the quarter to collect samples from storm events. Visual samples were collected from 1 out of 1 outfalls over the course of the 2 mobilizations.
- CDM Smith Sites Group 1 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 4 out of 8 outfalls over the course of the 1 mobilization.
- CDM Smith Sites Group 2 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 0 out of 6 outfalls over the course of the 1 mobilization.

- CDM Smith Sites Group 3 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 1 out of 3 outfalls over the course of the 1 mobilization.
- CDM Smith Sites Group 4 mobilized 1 time during the quarter to collect samples from storm events. Visual samples were collected from 2 out of 4 outfalls over the course of the 1 mobilization.

The monitoring reports and photo logs from Weston Sites Groups 1 through 3 can be found in the Appendix. Any outfalls not monitored in Quarter 1 will be made up during Quarter 2 of 2018 pending suitable weather conditions.

Observed Problems

In general very few pollution problems were observed at any of the outfalls with few exceptions. Many of the grab samples exhibited presence of sediment, but no pollutants required follow up inspections or actions to occur. There were limited to no issues with oils, floatables, salts, chemicals, or other pollutant sources.

Results from the Quarter 1 Visual Inspections can be found in the Appendix. Twenty three out of 24 facilities were observed during the 1st Quarter. As noted above, the 1st Quarter experienced only two storm events that produced measurable runoff. Many sites received no rain due to the localized nature of the storm that did occur. Any facilities or outfalls that did not produce a sample in Quarter 1, 2018 will be made up in the coming months.

We appreciate the opportunity to provide professional consulting services to you and we look forward to assisting you in the next quarter. Please contact

Sarah Luckie at (505) 837-6540 (Sarah.Luckie@WestonSolutions.com) or
Brad Sumrall at (505) 837-6566 (Brad.Sumrall@WestonSolutions.com) if you have any questions or need additional information.

Sincerely,
WESTON SOLUTIONS, INC.

L. Brad Sumrall, PE
Albuquerque Operations Manager

ATTACHMENT A: Q1 INSPECTION FORMS AND PHOTO LOGS

ATTACHMENT B: NON-QUALIFYING MEMO

APPENDIX A: Q4 INSPECTION FORMS & PHOTO LOGS- VISUAL INSPECTIONS

STREETS MAINTENANCE SATELLITE #1

City of Albuquerque
Street Maintenance Satellite #1

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☒Q2 ☐Q3 ☐Q4
CTJ

Date: 1/10/18 **Weather:** RAIN JUST STOPPED

Time: 1010 **Storm Precip:** NONE

Inspector: C T IRWIN **Last 72 hour Precip:** ______

Photo: YES

Outfall ID:	SS1A NORTH	SS1B SOUTH
Flow Observed:	☐Yes ☒No	☒Yes ☐No
Description of Monitoring Site:	W/ ADDLE AROUND 4x4 GRATE	W/ ADDLE SURROUNDING 4x4 GRATE
Flow Estimate (include units and method of estimation):	NONE	< 8oz/MIN
Other Observations:		
Color (describe):		BROWN
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☒Very Cloudy ☒Opaque
Floating Solids:	☐Yes ☐No	☐Yes ☒No
Suspended Solids:	☐Yes ☐No	☒Yes ☐No
Settled Solids:	☐Yes ☐No	☒Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☒No
Odor:	☐Yes ☐No	☐Yes ☒No
Foam Present:	☐Yes ☐No	☐Yes ☒No
Describe:		

Additional Comments: ______

CDM Smith

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: C.T. Irwin (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Street Maintenance Satellite #1	
 Flow at Outfall SS1A	 Flow at Outfall SS1B

STREETS MAINTENANCE SATELLITE #2

City of Albuquerque
Street Maintenance Satellite #2

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

Date: 01/10/2018
Time: 9:40
Inspector: Kathryn Hayden (Weston)
Signature: KH

Weather: Light Rain
Storm Precip:
Last 72 Hour Precip: ø
Photo: Attached

Outfall ID:	SS2	
Flow Observed:	☒ Yes	☐ No
Description of Monitoring Site:	Storm drain at northeast corner of site	
Flow Estimate (include units and method of estimation) :	< 1cfs - visual	
Other Observations:		
Color (Describe):	Reddish Brown	
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	
Floating Solids:	☐ Yes	☒ No
Suspended Solids:	☐ Yes	☒ No
Settled Solids:	☐ Yes	☒ No
Sheen Present:	☐ Yes	☒ No
Odor:	☐ Yes	☒ No
Foam Present:	☐ Yes	☒ No
Describe:		

Additional Comments:

WESTON SOLUTIONS

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Street Maintenance Satellite #2	
 Flow at Outfall SS2	 Sample Taken at Outfall SS2

STREETS MAINTENANCE SATELLITE #3

City of Albuquerque
Street Maintenance Satellite #3

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☑Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/2018 **Weather:** cloudy/overcast

Time: 9:34 AM **Storm Precip:** None

Inspector: AReed **Last 72 hour Precip:** within last 45min

Photo: 2

Outfall ID:	SS3	
Flow Observed:	☐Yes	☑No
Description of Monitoring Site:		
Flow Estimate (include units and method of estimation):	None	
Other Observations:		
Color (describe):	N/A	
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	
Floating Solids:	☐Yes	☐No
Suspended Solids:	☐Yes	☐No
Settled Solids:	☐Yes	☐No
Sheen Present:	☐Yes	☐No
Odor:	☐Yes	☐No
Foam Present:	☐Yes	☐No
Describe:		

Additional Comments: fresh liquid staining on concrete channel past berm at SS3. unknown what was discharged but looks manmade. Up close look showed no sheen or black residue. Possibly dumping of a water tanks.

CDM Smith

Date:	January 10, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	A. Reed (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Street Maintenance Satellite #3	
 Outfall SS3	

STORM DRAINAGE MAINTENANCE ARROYO MAINTENANCE SECTION

City of Albuquerque
Storm Drainage Maintenance Arroyo Maintenance Section

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☒Q2 ☐Q3 ☐Q4
CTJ

Date: 1/10/18 **Weather:** SPRINKLING
Time: 1025 **Storm Precip:** ~0.1 IN
Inspector: IRWIN **Last 72 hour Precip:** ZERO
Photo: yes

Outfall ID:	**AM1**
Flow Observed:	☒Yes ☐No
Description of Monitoring Site:	CULVERT W/ WADDLE LEADS TO DRAIN ON CURB/GUTTER ON ALTEZ ST.
Flow Estimate (include units and method of estimation):	~8oz/MIN
Other Observations:	
Color (describe):	NONE
Turbidity:	☒Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☒No
Suspended Solids:	~~☒Yes~~ ☒No NO
Settled Solids:	☒Yes ☐No
Sheen Present:	☐Yes ☒No
Odor:	☐Yes ☒No
Foam Present:	☐Yes ☒No
Describe:	

Additional Comments: ______________________

Date:	January 10, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	C.T. Irwin (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Storm Drainage Maintenance Arroyo Maintenance Section

Outfall AM1

Outfall AM1

PINO YARDS COMPLEX

City of Albuquerque
Pino Yards Complex

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

Date:	3/27/18	Weather:	light rain
Time:	12:56 pm	Storm Precip:	yes
Inspector:	David Cooper	Last 72 Hour Precip:	no
Signature:	David Cooper	Photo:	yes

Outfall ID:	PY1	PY2	PY3
Flow Observed:	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No
Description of Monitoring Site:	synthetic wattle around site	" "	~~synthetic wattle~~ ~~around~~ concrete rundown to a linear pond DC 3/27/18
Flow Estimate (include units and method of estimation) :			<1cfs
Other Observations:			only east curb flowing
Color (Describe):			brown
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☒ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
Odor:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No
Describe:			—

Additional Comments:

WESTON SOLUTIONS

Date: March 27, 2018

Event: MS4 Visual Storm Monitoring

Inspector: David “Sonny” Cooper (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Pino Yards Complex	
 Outfalls PY1 and PY2	 Flow at Outfall PY3
 Sample from Outfall PY3	

YALE MAINTENANCE FACILITY

City of Albuquerque
Yale Maintenance Facility

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18
Time: 11:00am
Inspector: D. Williams, T. Heisey

Weather: Overcast
Storm Precip: 0.03-inch
Last 72 hour Precip: 0.00-inches
Photo: Yes

Outfall ID:	**Y1**
Flow Observed:	☒Yes ☐No minimal - uncollectable
Description of Monitoring Site:	Inlet to storm ceptor
Flow Estimate (include units and method of estimation):	less than 0.5GPM (visual)
Other Observations:	
Color (describe):	N/A
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☒No
Suspended Solids:	☐Yes ☒No
Settled Solids:	☐Yes ☒No
Sheen Present:	☐Yes ☒No
Odor:	☐Yes ☒No
Foam Present:	☐Yes ☒No
Describe:	

Additional Comments: Water sample was uncollectable due to low flow

CDM Smith

Date:	January 10, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	D. Williams and T. Heisey (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Yale Maintenance Facility	
 Outfall Y1	

WEST SIDE MAINTENANCE FACILITY (DAYTONA)

City of Albuquerque
West Side Maintenance Facility (Daytona)

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☑Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18 **Weather:** Cloudy/Overcast

Time: 10:32 AM **Storm Precip:** No

Inspector: A. Reed **Last 72 hour Precip:** ~~with last hour~~ - raindroplets not observed, staining ground - unsure if storm hit here.

Photo: 2

Outfall ID:	**D1**	**D2**
Flow Observed:	☐Yes ☑No	☐Yes ☑No
Description of Monitoring Site:	MANHOLE	Area under construction - unobservable
Flow Estimate (include units and method of estimation):	None	None
Other Observations:		
Color (describe):	N/A	N/A
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No	☐Yes ☑No
Suspended Solids:	☐Yes ☐No	☐Yes ☐No
Settled Solids:	☐Yes ☐No	☐Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☐No
Odor:	☐Yes ☐No	☐Yes ☐No
Foam Present:	☐Yes ☐No	☐Yes ☐No
Describe:		

Additional Comments: D2 not observable. Ongoing construction has blocked view outside of fence. SWPPPs site plan being updated by Weston Solutions which will offer new insite on outfall locations.

CDM Smith

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: A. Reed (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

West Side Maintenance Facility (Daytona)	
 Outfall D1	 Outfall D2

BALLOON FIESTA PARK AND GOLF TRAINING CENTER

City of Albuquerque

Balloon Fiesta Park and Golf Training Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☐ Q2 ☐ Q3 ☒ Q4

Date: October 5, 2017
Time: 10:20
Inspector: Kathryn Hayden
Signature: KAH

Weather: Cloudy / Drizzle
Storm Precip: 0.07
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	BFP4	BFP5
Flow Observed:	☐ Yes ☒ No	☐ Yes ☒ No
Description of Monitoring Site:		
Flow Estimate (include units and method of estimation) :		
Other Observations:		
Color (Describe):		
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☐ No
Odor:	☐ Yes ☐ No	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☐ No
Describe:		

Additional Comments: Flow at the park had mostly stopped

WESTON SOLUTIONS

City of Albuquerque
Balloon Fiesta Park and Golf Training Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☐ Q2 ☐ Q3 ☒ Q4

Date:	October 5, 2017	Weather:	Cloudy/Drizzle
Time:	10:20	Storm Precip:	0.07 in
Inspector:	Kathryn Hayden	Last 72 Hour Precip:	Ø
Signature:	[signature]	Photo:	Yes

Outfall ID:	BFP1	BFP2	BFP3
Flow Observed:	☒ Yes ☐ No	☐ Yes ☒ No	☒ Yes ☐ No
Description of Monitoring Site:	Storm drains in middle of field		Outfall @ south end of park
Flow Estimate (include units and method of estimation) :	<1 cfs		<1 cfs
Other Observations:			
Color (Describe):	Tan		Brown
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No	☐ Yes ☐ No	☒ Yes ☒ No
Sheen Present:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Odor:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No	☐ Yes ☐ No	☒ Yes ☐ No
Describe:			

Additional Comments: Flow at the park had mostly stopped ~~from~~

WESTON SOLUTIONS

Date:	October 5, 2017
Event:	MS4 Stormwater Visual Monitoring
Inspector:	Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Balloon Fiesta Park	
 BFP1 Flow	 BFP1 Discharge
 BFP2 – No Flow	 BFP3 Flow

BFP 3 Discharge

BFP 4 – No Flow

BFP 5 – No Flow

MONTESSA PARK OPEN SPACE

City of Albuquerque
Montessa Park Open Space

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/2018
Time: 8:50 am
Inspector: D. Williams, T. Hersey

Weather: Overcast, light rain
Storm Precip: 0.03-inch
Last 72 hour Precip: 0.00-inch
Photo: yes

Outfall ID:	MP1	MP2
Flow Observed:	☐Yes ☒No	☐Yes ☒No
Description of Monitoring Site:	Facility outfall	Arroyo outfall
Flow Estimate (include units and method of estimation):	Ø	Ø
Other Observations:	No flows observed	
Color (describe):	N/A	N/A
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No	☐Yes ☐No
Suspended Solids:	☐Yes ☐No	☐Yes ☐No
Settled Solids:	☐Yes ☐No	☐Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☐No
Odor:	☐Yes ☐No	☐Yes ☐No
Foam Present:	☐Yes ☐No	☐Yes ☐No
Describe:		

Additional Comments:

CDM Smith

Date:	January 1, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	D. Williams and T. Heisey (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Montessa Park Open Space


Outfall MP1


Outfall MP2

LOS ALTOS GOLF COURSE

City of Albuquerque
Los Altos Golf Course

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18 **Weather:** Raining
Time: 0925 **Storm Precip:** ~0.1 in.
Inspector: C Irwin **Last 72 hour Precip:**
Photo: yes

Outfall ID:	OUTFALL LA1	GATE LA2
Flow Observed:	☐Yes ☒No	☒Yes ☐No
Description of Monitoring Site:	8 FT. DIAMETER PIPE	LOW SPOT ON ASPHALT DRIVE AREA
Flow Estimate (include units and method of estimation):	NONE	CONTINUOUS SHEET FLOW ~8oz/min -
Other Observations:		
Color (describe):	Ø	
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☒Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No	☒Yes ☐No
Suspended Solids:	☐Yes ☐No	☒Yes ☐No
Settled Solids:	☐Yes ☐No	☒Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☒No
Odor:	☐Yes ☐No	☐Yes ☒No
Foam Present:	☐Yes ☐No	☐Yes ☒No
Describe:		SLIGHT ACCUMULATION ON TOP OF CONCRETE TANKHOLD

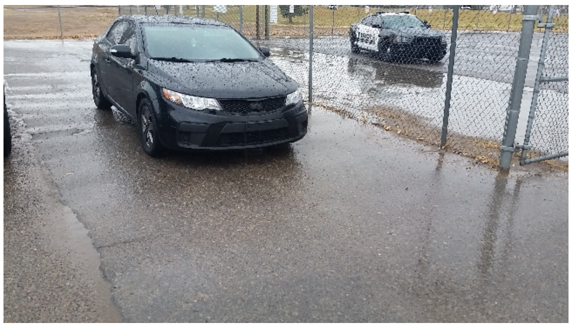
Additional Comments: LA2: TOO SHALLOW TO COLLECT SAMPLE. DESCRIPTION BASED ON VISUAL INSPECTION.

CDM Smith

Date:	January 1, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	CT. Irwin (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Los Altos Golf Course



Outfall LA1

Outfall LA2

PUERTO DEL SOL GOLF COURSE

City of Albuquerque
Puerto del Sol Golf Course

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18
Time: 10:55
Inspector: D. Williams, T. Hersey

Weather: overcast
Storm Precip: 0.03-inch
Last 72 hour Precip: 0.00-inch
Photo: Yes

Outfall ID:	**PDS1**	**PDS2**
Flow Observed:	☐Yes ☒No	☐Yes ☒No
Description of Monitoring Site:	Inlet	Inlet
Flow Estimate (include units and method of estimation):	N/A	N/A
Other Observations:	leaves + plant debris @ storm drain inlet	leaves, grass, sediment
Color (describe):	N/A	N/A
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☒No	☐Yes ☒No
Suspended Solids:	☐Yes ☒No	☐Yes ☒No
Settled Solids:	☐Yes ☒No	☐Yes ☒No
Sheen Present:	☐Yes ☒No	☐Yes ☒No
Odor:	☐Yes ☒No	☐Yes ☒No
Foam Present:	☐Yes ☒No	☐Yes ☒No
Describe:		

Additional Comments:

CDM Smith

Date:	January 10, 2018
Event:	MS4 Visual Storm Monitoring
Inspector:	D Williams and T. Heisey (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Puerto Del Sol Golf Course	
 Outfall PDS1	 Outfall PDS2

LADERA GOLF COURSE

City of Albuquerque

~~Los Altos~~ Ladera **Golf Course**

Quarterly Visual Monitoring of

Storm Water Outfall Discharges

☑Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18

Time: 9:00

Inspector: A Reed

Weather: cloudy/overcast

Storm Precip: None

Last 72 hour Precip: Within last hour - small sprinkle reported by employees

Photo: NoNe - construction/maintenance activities taking place around outfalls

Outfall ID:	LGC ~~LA1~~		LGC ~~LA2~~	
Flow Observed:	☐Yes	☐No	☐Yes	☐No
Description of Monitoring Site:				
Flow Estimate (include units and method of estimation):	None		None	
Other Observations:				
Color (describe):	N/A		N/A	
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque		☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	
Floating Solids:	☐Yes	☐No	☐Yes	☐No
Suspended Solids:	☐Yes	☐No	☐Yes	☐No
Settled Solids:	☐Yes	☐No	☐Yes	☐No
Sheen Present:	☐Yes	☐No	☐Yes	☐No
Odor:	☐Yes	☐No	☐Yes	☐No
Foam Present:	☐Yes	☐No	☐Yes	☐No
Describe:				

Additional Comments: Missed rain event. Small sprinkle reported by employees.

ARROYO DEL OSO GOLF COURSE

City of Albuquerque
Arroyo Del Oso Golf Course

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☐ Q2 ☐ Q3 ☒ Q4

Date: October 4, 2017
Time: 1:35
Inspector: Kathryn Hayden
Signature: KH

Weather: Partly Cloudy
Storm Precip:
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	AD01	AD02
Flow Observed:	☐ Yes ☒ No	☒ Yes ☐ No
Description of Monitoring Site:		Arroyo beneath bridge
Flow Estimate (include units and method of estimation) :		<1cfs
Other Observations:		~~clear~~
Color (Describe):		clear
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☒ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☐ No	☒ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☒ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☒ No
Odor:	☐ Yes ☐ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☒ No
Describe:		

Additional Comments: Low flow present in the Arroyo at AD02 from upstream/mountain (?) rains. No recent rain at outfall location.

WESTON SOLUTIONS

Date:	October 4, 2017
Event:	MS4 Stormwater Visual Inspection
Inspector:	Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Arroyo Del Oso Golf Course	
 ADO2 Sample	

FIRE DEPARTMENT MECHANICS OP

City of Albuquerque
Fire Department Mechanic Shop

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

Date: 01/10/2018
Time: 9:00
Inspector: Kathryn Hayden (Weston)
Signature: KH

Weather: Light Rain
Storm Precip:
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	FM1	FM2
Flow Observed:	☒ Yes ☐ No	☒ Yes ☐ No
Description of Monitoring Site:	Outside of fence on other side of wattle	Outside of fence
Flow Estimate (include units and method of estimation) :	<1cfs	<1cfs
Other Observations:		
Color (Describe):	tan	tan
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No	☒ Yes ■ No
Suspended Solids:	☐ Yes ☒ No	☐ Yes ☒ No
Settled Solids:	☒ Yes ☐ No	☒ Yes ☐ No
Sheen Present:	☒ Yes ☐ No	☐ Yes ☒ No
Odor:	☐ Yes ☒ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No	☐ Yes ☒ No
Describe:	Sheen present on flow side of wattle	

Additional Comments:

WESTON SOLUTIONS

Date: January 10, 2018

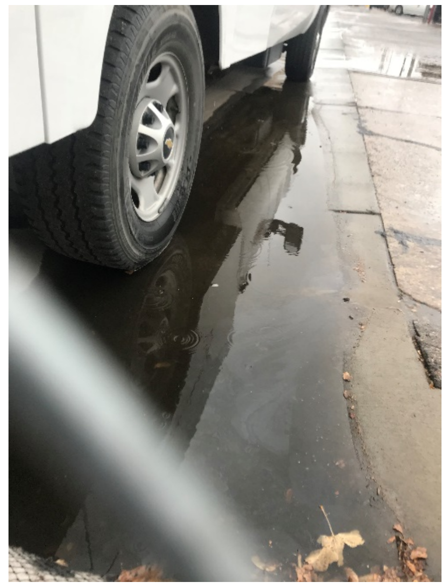
Event: MS4 Visual Storm Monitoring

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Fire Department Mechanic Shop

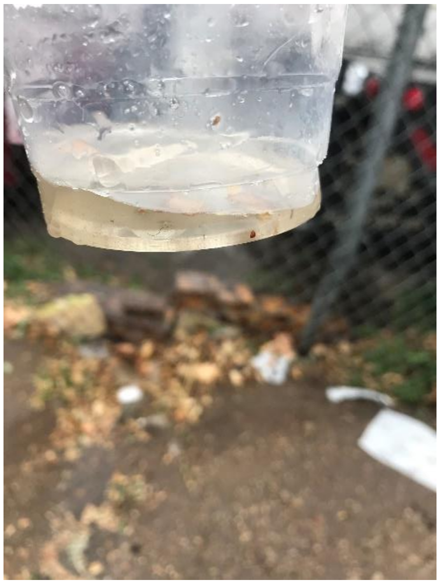
Flow at Outfall FM1



Sheen Present at Outfall FM1

Sample Taken at Outfall FM1

Flow Past FM2

 Sample Taken from FM2	

4TH STREET FUEL STATION

City of Albuquerque
4th Street Fuel Station

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

Date: 01/10/2018
Time: 9:05
Inspector: Kathryn Hayden (Weston)
Signature: KAH

Weather: Light Rain
Storm Precip:
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	FS1	
Flow Observed:	☒ Yes	☐ No
Description of Monitoring Site:	Storm Drain	
Flow Estimate (include units and method of estimation) :	<1cfs - visual	
Other Observations:		
Color (Describe):	Green-Gray-Brown	
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	
Floating Solids:	☒ Yes	☐ No
Suspended Solids:	☒ Yes	☐ No
Settled Solids:	☐ Yes	☒ No
Sheen Present:	☐ Yes	☒ No
Odor:	☐ Yes	☒ No
Foam Present:	☐ Yes	☒ No
Describe:		

Additional Comments:

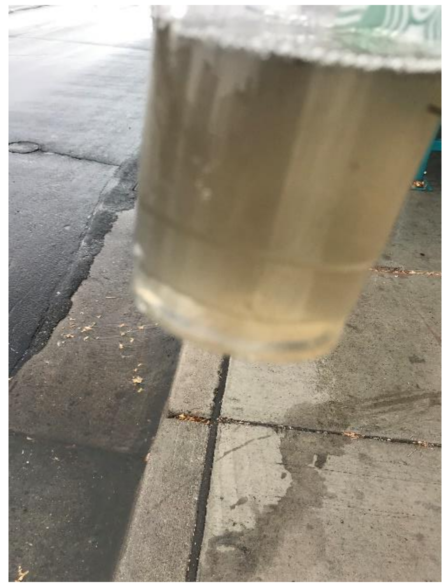
WESTON SOLUTIONS

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

4th Street Fuel Station	
 Flow at Outfall FS1	 Sample Taken at Outfall FS1

LOMAS FUEL STATION

City of Albuquerque
Lomas Fuel Station

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☒Q2 ☐Q3 ☐Q4

CTJ

Date:	1/10/18	**Weather:**	RAINING
Time:	0910	**Storm Precip:**	~0.1 inch
Inspector:	CT IRWIN	**Last 72 hour Precip:**	0
		Photo:	yes

Outfall ID:	L1	
Flow Observed:	☒Yes	☐No
Description of Monitoring Site:	LOW SPOT ON ASPHALT	
Flow Estimate (include units and method of estimation):	8OZ/MIN.	
Other Observations:	DISCONTINUOUS SHEET FLOW	
Color (describe):	NONE	
Turbidity:	☒Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	
Floating Solids:	☐Yes	☒No
Suspended Solids:	☐Yes	☒No
Settled Solids:	☐Yes	☒No
Sheen Present:	☐Yes	☒No
Odor:	☐Yes	☒No
Foam Present:	☐Yes	☒No
Describe:		

Additional Comments:

CDM Smith

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: CT Irwin (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Lomas Fuel Station	
 Outfall L1	

ALBUQUERQUE BIOPARK ZOO

City of Albuquerque
ABQ BioPark Zoo

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

Date: 01/10/2018
Time: 8:30 am
Inspector: Kathryn Hayden (Weston)
Signature: KAH

Weather: Light Rain
Storm Precip:
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	BP1
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	
Flow Estimate (include units and method of estimation) :	
Other Observations:	
Color (Describe):	
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No
Odor:	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No
Describe:	

Additional Comments: No flow observed at outfall

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Albuquerque BioPark Zoo	
 No Flow at Outfall BP1	 Wattle at Outfall BP1

6TH STREET PARK MANAGEMENT

City of Albuquerque
6th Street Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

Date:	01/10/2018	Weather:	Light Rain
Time:	9:30	Storm Precip:	
Inspector:	Kathryn Hayden (WESTON)	Last 72 Hour Precip:	∅
Signature:	KAH	Photo:	Attached

Outfall ID:	6PM1
Flow Observed:	☒ Yes ☐ No
Description of Monitoring Site:	Southwest corner, outside fence
Flow Estimate (include units and method of estimation) :	<1cfs - visual
Other Observations:	
Color (Describe):	light brown/tan
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☒ Yes ☐ No
Suspended Solids:	☐ Yes ☒ No
Settled Solids:	☒ Yes ☐ No
Sheen Present:	☒ Yes ☐ No
Odor:	☐ Yes ☒ No
Foam Present:	☒ Yes ☐ No
Describe:	

Additional Comments:

WESTON SOLUTIONS

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

6th Street Park Management

Flow at Outfall 6PM1

Sample Collected from Outfall 6PM1

Sheen Observed at Outfall 6PM1

LOS ALTOS PARK MANAGEMENT

City of Albuquerque
Los Altos Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒ Q1 ☐ Q2 ☐ Q3 ☐ Q4

CTI

Date:	1/10/18	Weather:	RAINING
Time:	0948	Storm Precip:	~0.10 INCH
Inspector:	C T IRWIN	Last 72 Hour Precip:	NONE
Signature:	CTI	Photo:	yes

Outfall ID:	LAP1
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	16 IN. DIAMETER CONCRETE CULVERT
Flow Estimate (include units and method of estimation) :	NONE
Other Observations:	NONE
Color (Describe):	Ø
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No
Odor:	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No
Describe:	

Additional Comments:

LOS ALTOS MEDIANS PARK MANAGEMENT

City of Albuquerque
Los Altos Medians Park Management

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☑ Q1 ☒ Q2 CT ☐ Q3 ☐ Q4

Date:	1/10/18	Weather:	RAINING
Time:	0904	Storm Precip:	~ 0.1 INCH
Inspector:	CT IRWIN	Last 72 Hour Precip:	
Signature:	CT	Photo:	yes

Outfall ID:	LAM1
Flow Observed:	☐ Yes ☒ No
Description of Monitoring Site:	IRON GRATE NW END OF SITE
Flow Estimate (include units and method of estimation) :	~ 16oz/MINUTE
Other Observations:	
Color (Describe):	NONE
Turbidity:	☒ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No
Sheen Present:	☐ Yes ☒ No
Odor:	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No
Describe:	T

Additional Comments: TOO SHALLOW TO GRAB A SAMPLE.
DESCRIPTION BASED ON OBSERVATION OF FLOW.

WESTON SOLUTIONS

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: C.T. Irwin (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Los Altos Medians Park Management	
 Outfall LAP1	

MONTESSA PARK CONVENIENCE CENTER

City of Albuquerque Solid Waste Management Department
Montessa Park Convenience Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18 **Weather:** Overcast light rain
Time: 9:00am **Storm Precip:** 0.03-inch
Inspector: D. Williams, T. Heisey **Last 72 hour Precip:** 0.00-inch
Photo ~~Name~~: yes

Outfall ID:	**MP01**	**MP02**
Flow Observed:	☒Yes ☐No	☒Yes ☐No
Description of Monitoring Site:	Very minimal, Gutter near facility exit	Very minimal, Gutter by trench drain
Flow Estimate (include units and method of estimation):	Less than 1 GPM	Less than 1 GPM
Other Observations:		
Color (describe):	Turbid brown	Turbid brown
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☒Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☒Opaque
Floating Solids:	☒Yes ☐No	☒Yes ☐No
Suspended Solids:	☒Yes ☐No	☒Yes ☐No
Settled Solids:	☒Yes ☐No	☒Yes ☐No
Sheen Present:	☐Yes ☒No	☒Yes ☐No
Odor:	☐Yes ☒No	☒Yes ☐No slight petroleum product smell
Foam Present:	☐Yes ☒No	☐Yes ☒No
Probable sources of observed stormwater contamination, if any:	Natural small debris from soil, grass, dirt, etc.	Visible sheen observed, and small debris from soil

Additional Comments:

CDM Smith

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: D. Williams and T. Heisey (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Montessa Park Convenience Center


Outfall MPO1


Sample from MPO1


Outfall MP02

Sample from MP02

DON RESERVIOR CONVENIENCE CENTER

City of Albuquerque Solid Waste Management Department

Don Reservoir Convenience Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☑Q1 ☐Q2 ☐Q3 ☐Q4

Date: 1/10/18 **Weather:** Cloudy/overcast

Time: 9:20 **Storm Precip:** No

Inspector: AReed **Last 72 hour Precip:** yes, 30 min ago

Photo Name: DR01 (2 pics)

Outfall ID:	DR01
Flow Observed:	☐Yes ☑No
Description of Monitoring Site:	CLEAN.
Flow Estimate (include units and method of estimation):	None.
Other Observations:	
Color (describe):	N/A
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No
Suspended Solids:	☐Yes ☐No
Settled Solids:	☐Yes ☐No
Sheen Present:	☐Yes ☐No
Odor:	☐Yes ☐No
Foam Present:	☐Yes ☐No
Probably sources of observed stormwater contamination, if any:	

Additional Comments: missed rain event. Comment from worker was it was a light sprinkle v started as soon as it stopped.

CDM Smith

Last Updated: 06/06/2016

Date: January 10, 2018

Event: MS4 Visual Storm Monitoring

Inspector: A. Reed (CDM Smith)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Don Reservoir Convenience Center	
 Outfall DR01	

EAGLE ROCK CONVENIENCE CENTER

City of Albuquerque Solid Waste Management Department

Eagle Rock Convenience Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 3/27/18 **Weather:** Light rain

Time: 1:18 pm **Storm Precip:** yes

Inspector: David Cooper **Last 72 hour Precip:** no

*ER01/ER02 must be alternated every quarter **Photo Name:** ______

Outfall ID:	**ER02 / ER01 (circle one)**	**ER03**
Flow Observed:	☐Yes ☒No	☒Yes ☐No
Description of Monitoring Site:		concrete run down to catchment area
Flow Estimate (include units and method of estimation):		<1cfs
Other Observations:		—
Color (describe):		Light brown
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☒Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No	☒Yes ☐No
Suspended Solids:	☐Yes ☐No	☒Yes ☐No
Settled Solids:	☐Yes ☐No	☒Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☒No
Odor:	☐Yes ☐No	☐Yes ☒No
Foam Present:	☐Yes ☐No	☐Yes ☒No
Probable sources of observed stormwater contamination, if any:		solids from trash and/or debris from trucks

Additional Comments: ______

CDM Smith

Date: March 27, 2018

Event: MS4 Visual Storm Monitoring

Inspector: David "Sonny" Cooper (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Eagle Rock Convenience Center	
 Outfall ER1	 Outfall ER2
 Outfall ER3	 Sample Collected from Outfall ER3

EDITH YARDS MAINTENANCE FACILITY

City of Albuquerque Solid Waste Management Department
Edith Yards Maintenance Facility

Quarterly Visual Monitoring of
Storm Water Outfall Discharges
☒Q1 ☐Q2 ☐Q3 ☐Q4

Date: 3/27/18 **Weather:** cloudy
Time: 1500 **Storm Precip:**
Inspector: Andrew Brennen **Last 72 hour Precip:** No
Photo Name: Yes

Outfall ID:	**EY01**	**EY02**	**EY03**
Flow Observed:	☐Yes ☒No	☐Yes ☒No	☐Yes ☒No
Description of Monitoring Site:	—	—	—
Flow Estimate (include units and method of estimation):	—	—	—
Other Observations:	—	—	—
Color (describe):	—	—	—
Turbidity:	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque	☐Clear ☐Slightly Cloudy ☐Very Cloudy ☐Opaque
Floating Solids:	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Suspended Solids:	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Settled Solids:	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Sheen Present:	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Odor:	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Foam Present:	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Probable sources of observed stormwater contamination, if any:	—	—	—

Additional Comments: Called Tom Portillo at 1323 and left a message asking for site access (3/27/18) Called Martin Vargas at 1434 and asked for site access. Said I could come on-site.

CDM Smith

Date: March 27, 2018

Event: MS4 Visual Storm Monitoring

Inspector: Andrew Brenner (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Edith Yards Maintenance Facility

Outfall EY01

Outfall EY02

Outfall EY03

APPENDIX B: Q4 NON- QUALIFYING MEMO

6001 Indian School Rd. NE, Suite 310
Albuquerque, NM 87110
tel: 505 243-3200
fax: 505 243-2700

January 9, 2017

Mr. Brad Sumrall, P.E.
Weston Solutions Inc.
3840 Commons Ave NE
Albuquerque, New Mexico 87109

Subject: Visual Stormwater Monitoring at the City of Albuquerque
Fourth Quarter 2017 (Task Order 19 Visual Stormwater Monitoring)
CDM Smith Project No: 76998-224341

Dear Mr. Sumrall:

CDM Smith Inc. (CDM Smith) herein notifies Weston Solutions Inc. (Weston) that a visual stormwater monitoring event was not conducted for the following City of Albuquerque facilities during the fourth quarter (Q4) of 2017:

- Arroyo Street Maintenance
- Daytona Transit Center
- Don Reservoir Convenience Center
- Ladera Golf Course
- Lomas Fuel Station
- Los Altos Golf Course
- Los Altos Park Management
- Los Altos Trails Park Management
- Montessa Park Convenience Center
- Montessa Park Open Space
- Puerto del Sol Golf Course
- Streets Satellite #1
- Streets Satellite #3
- Yale Transit Center

The National Weather Service (NWS) weather station, located approximately two to eight miles from the facilities, records precipitation event data. Precipitation events for October 2017 through December 2017 are included in **Attachment A**. Daily NWS weather reports, with data obtained from the weather station for days when precipitation was observed, are included in **Attachment B**. The events with measurable precipitation occurring during this time are summarized in **Table 1**.

Section 3.2 of 2015 Multi Sector General Permit (MSGP) describes the criteria regarding the precipitation event that must be met to qualify as an assessment event. Visual assessment of stormwater must occur:

- On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and you must document why it was not possible to take the sample within the first 30 minutes.
- For storm events on discharges that occur at least 72 hours (three days) from the previous discharge.

An additional limitation on the timing of sampling activities within the City of Albuquerque is described in the City's Storm Water Management Plan (SWMP, December 2016). Section 13.3.1.2 of the SWMP limits sampling to normal business hours – Monday through Friday, 7:30 am to 5:00 pm and not required on the following observed holidays: Thanksgiving Day and Christmas Day through New Year's Day. Therefore, storm events that occur outside of normal business hours or on a holiday are not considered qualifying events.

CDM Smith's past visual monitoring experience for City of Albuquerque facilities has shown that stormwater discharges from facilities typically do not occur for precipitation events of less than 0.1 inch of measurable rainfall. Therefore, events with less than 0.1 inch of measurable rainfall do not create a discharge and are not considered for visual assessment.

Table 1 Fourth Quarter 2017 Precipitation Events

Date	Total Precipitation (Inches)	Event Start Time	Notes
Wednesday, 10/4/2017	0.02	11:52pm	Light rain started at 11:52 pm. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.
Thursday, 10/5/2017	0.02	12:04 am	Light rain started at 12:04 am, light rain and thunderstorms continued until 1:54 am. Trace amounts of rainfall occurred throughout the day. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.

Table 1 Fourth Quarter 2017 Precipitation Events

Date	Total Precipitation (Inches)	Event Start Time	Notes
Friday, 10/6/2017	Trace Amount	5:52 am	Light rain started at 5:52 am and no other rain events occurred. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.
Thursday, 10/19/2017	Trace Amount	8:52 pm	Light rain started at 8:52 pm. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.
Thursday, 12/7/2017	0.01	11:52 am	Light snow started at 11:52 am and no other snow events occurred. Non-qualifying due to less than 0.1-in of rainfall.

Notes: Events shaded in gray are non-qualifying events. Bold indicates qualifying events.

No qualifying precipitation events occurred in Q4 of 2017, as shown in **Table 1**. Rain and snow events did not accumulate greater than 0.1-inch and/or did not occur during normal business hours. Due to these circumstances, visual monitoring events were not conducted during Q4 of 2017 at any of the designated facilities.

Please contact CDM Smith at (505) 243-3200 if you have any questions or comments regarding this report.

Sincerely,

C. Tyler Irwin

Tyler Irwin, CPG, CHMM
Project Manager
CDM Smith Inc.

Trevin Heisey

Trevin Heisey
Project Engineer
CDM Smith Inc.

Attachments

cc: file

ATTACHMENT A

NWS WEATHER SUMMARY OCTOBER 1, 2017 TO DECEMBER 31, 2017

Albuquerque, NM

Albuquerque International Sunport

7:57 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

From:

October

1

2017

To:

December

31

2017

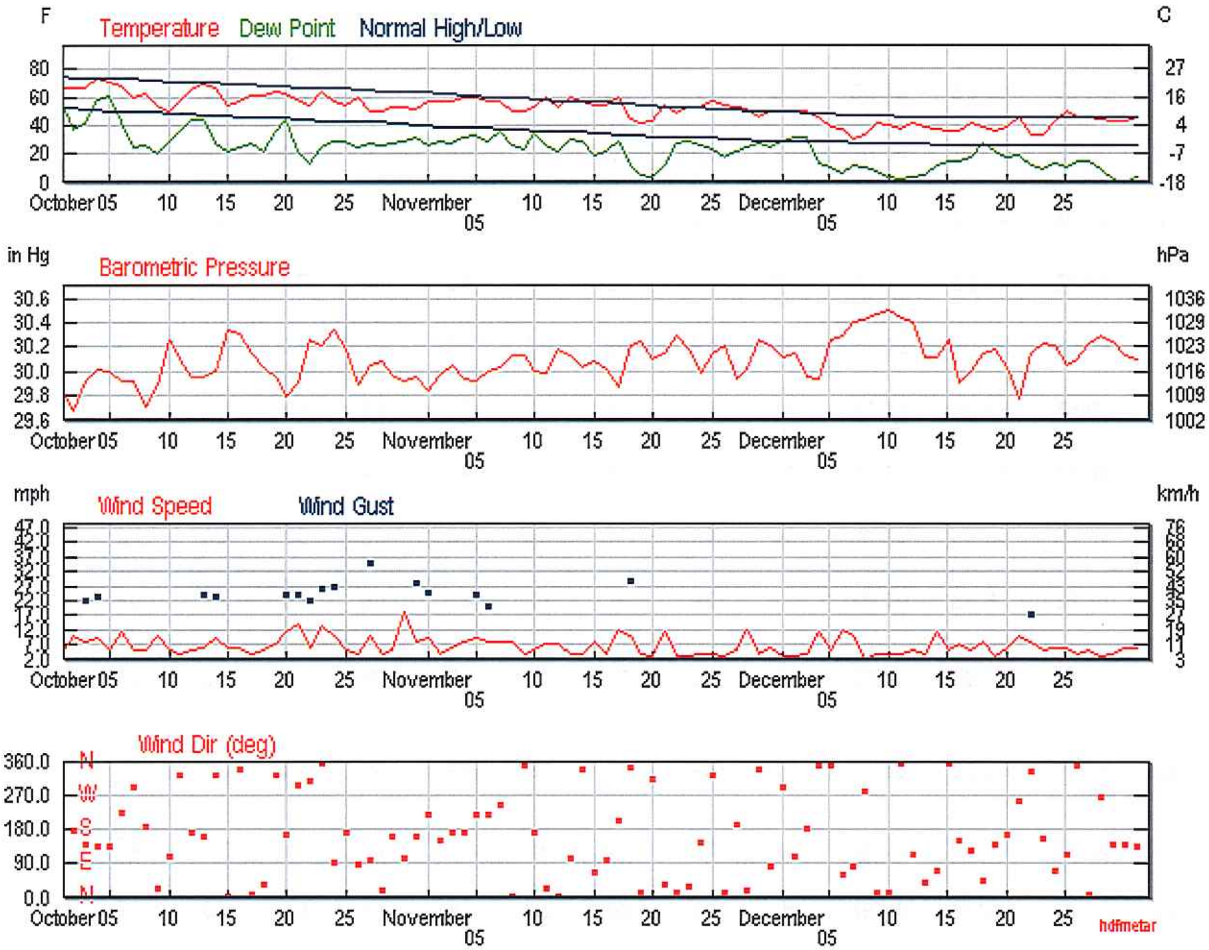
Get History

Daily | Weekly | Monthly | **Custom**

	Max	Avg	Min	Sum
Temperature				
Max Temperature	**82** °F	**64** °F	**37** °F	
Mean Temperature	**73** °F	**51** °F	**30** °F	
Min Temperature	**63** °F	**38** °F	**19** °F	
Degree Days				

	Max	Avg	Min	Sum
Heating Degree Days (base 65)	35	14	0	1302
Cooling Degree Days (base 65)	8	0	0	27
Growing Degree Days (base 50)	24	5	0	416
Dew Point				
Dew Point	**66** °F	**23** °F	**-7** °F	
Precipitation				
Precipitation	**0.02** in	**0.00** in	**0.00** in	**0.04** in
Snowdepth	**0.0** in	**0.0** in	**0.0** in	-
Wind				
Wind	**36** mph	**7** mph	**0** mph	
Gust Wind	**47** mph	**26** mph	**16** mph	
Sea Level Pressure				
Sea Level Pressure	**30.61** in	**30.09** in	**29.56** in	

Custom Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

1

Submit

Weather History & Observations

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Oct	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
	78	67	55	60	54	42	100	69	38	30.08	29.82	29.63	10	10	9	14	5	15	0.00	
	81	67	53	44	37	27	66	40	14	29.76	29.67	29.58	10	10	10	29	10	34	0.00	
	81	66	50	55	41	28	71	45	18	30.00	29.92	29.78	10	10	10	23	8	28	0.00	
	82	73	63	61	58	55	78	59	40	30.22	30.02	29.94	10	10	10	23	9	28	0.02	Rain , Thunderstorm
	77	70	62	66	61	57	93	79	64	30.25	29.99	29.86	10	10	7	17	5	22	0.02	Rain , Thunderstorm
	80	68	56	62	43	13	100	55	10	30.10	29.91	29.77	10	10	8	28	11	42	T	Rain
	74	60	45	33	25	18	45	31	16	30.01	29.91	29.81	10	10	10	14	5	18	0.00	
	78	62	45	38	26	11	66	38	10	29.81	29.70	29.56	10	10	10	18	5	24	0.00	
	64	54	43	24	20	13	39	28	16	30.19	29.88	29.67	10	10	10	24	10	31	0.00	
	62	49	36	32	29	24	82	54	26	30.37	30.25	30.16	10	10	10	18	5	22	0.00	
	70	56	42	40	35	31	70	49	28	30.19	30.09	29.99	10	10	10	12	4	17	0.00	
	79	65	50	46	44	41	71	50	28	30.04	29.95	29.86	10	10	10	15	5	18	0.00	
	80	69	57	52	44	38	72	49	26	30.04	29.95	29.86	10	10	10	22	6	27	0.00	
	80	67	54	51	27	9	75	41	7	30.17	30.00	29.92	10	10	10	21	9	27	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	65	54	43	29	21	12	45	32	18	30.42	30.33	30.18	10	10	10	16	6	20	0.00	
	71	57	42	28	25	21	53	34	15	30.42	30.30	30.20	10	10	10	12	6	15	0.00	
	76	61	46	34	27	20	50	31	12	30.26	30.14	30.03	10	10	10	9	4	12	0.00	
	77	61	45	29	21	10	46	28	9	30.12	30.03	29.96	10	10	10	13	5	16	0.00	
	76	64	51	52	36	24	83	52	21	30.02	29.94	29.83	10	10	7	25	7	32	T	Rain
	74	62	49	51	44	31	93	60	26	29.91	29.78	29.63	10	10	10	23	11	28	0.00	
	66	58	50	36	21	-1	43	27	10	30.14	29.90	29.70	10	10	10	23	14	36	0.00	
	70	54	37	25	13	1	29	21	13	30.34	30.25	30.15	10	10	10	18	6	24	0.00	
	76	63	50	34	25	22	43	29	15	30.27	30.21	30.12	10	10	10	30	13	37	0.00	
	65	56	47	34	29	23	50	39	27	30.44	30.34	30.28	10	10	10	30	10	37	0.00	
	68	54	39	33	28	22	65	42	19	30.34	30.18	29.95	10	10	9	16	5	21	0.00	
	74	59	43	33	24	11	49	31	13	30.03	29.88	29.76	10	10	10	9	4	11	0.00	
	58	49	40	32	27	24	58	44	30	30.12	30.04	29.93	10	10	10	31	10	42	0.00	
	61	50	38	28	26	24	59	42	25	30.17	30.07	30.00	10	10	10	10	4	12	0.00	
	68	53	37	29	27	25	64	42	19	30.09	29.97	29.84	10	10	10	12	5	14	0.00	
	61	52	42	32	29	27	58	45	31	30.00	29.91	29.84	10	10	10	36	18	45	0.00	
	62	51	40	37	32	27	66	51	36	30.06	29.94	29.82	10	10	10	25	8	29	T	
2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Nov	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
	73	57	41	35	26	13	65	38	10	29.88	29.83	29.72	10	10	10	26	9	32	0.00	
	71	57	43	33	29	24	58	40	22	30.09	29.96	29.84	10	10	10	13	4	15	0.00	
	69	56	42	29	27	25	53	37	20	30.20	30.04	29.95	10	10	10	20	6	25	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	68	60	51	36	32	29	50	38	26	30.01	29.93	29.82	10	10	10	24	8	31	0.00	
	71	60	49	40	33	25	61	40	18	29.98	29.91	29.83	10	10	10	24	9	30	0.00	
	69	57	44	32	28	24	50	35	19	30.17	29.99	29.91	10	10	10	18	8	25	0.00	
	63	56	48	42	36	31	71	54	36	30.11	30.03	29.96	10	10	10	16	8	23	0.00	
	59	49	38	38	26	13	85	52	19	30.19	30.12	30.06	10	10	10	16	8	21	0.00	
	62	49	35	29	23	16	56	39	22	30.21	30.12	30.04	10	10	10	13	4	15	0.00	
	68	53	38	41	34	28	66	45	24	30.12	30.00	29.89	10	10	10	13	5	14	0.00	
	71	59	46	41	26	13	77	44	10	30.05	29.98	29.91	10	10	10	14	7	19	0.00	
	65	53	41	27	21	17	39	29	18	30.26	30.18	30.09	10	10	10	15	7	19	0.00	
	71	59	46	34	30	27	53	38	22	30.22	30.13	30.05	10	10	10	12	4	14	0.00	
	71	57	42	37	28	14	70	43	16	30.14	30.03	29.91	10	10	10	13	4	15	0.00	
	66	54	41	21	19	16	39	27	14	30.18	30.08	30.03	10	10	10	22	8	27	0.00	
	71	54	36	25	22	19	54	35	15	30.12	30.01	29.91	10	10	10	12	4	13	0.00	
	73	60	46	40	28	17	55	36	16	29.95	29.87	29.77	10	10	10	32	12	46	0.00	
	53	44	34	35	12	2	53	33	13	30.34	30.21	29.88	10	10	7	32	10	47	0.00	
	53	41	29	10	5	0	39	26	13	30.35	30.24	30.12	10	10	10	12	4	16	0.00	
	58	43	27	9	3	-4	42	26	9	30.21	30.10	30.03	10	10	10	10	3	14	0.00	
	65	54	43	28	12	0	42	28	13	30.29	30.15	30.01	10	10	10	24	11	32	0.00	
	62	48	34	28	27	24	69	48	27	30.37	30.29	30.21	10	10	10	13	3	15	0.00	
	67	53	39	32	29	26	60	43	26	30.31	30.17	30.06	10	10	10	9	3	12	0.00	
	69	52	35	30	26	23	64	42	19	30.07	29.98	29.86	10	10	10	8	4	11	0.00	
	68	56	43	25	23	20	45	32	19	30.25	30.15	30.01	10	10	10	10	4	12	0.00	
	68	54	39	23	18	14	44	29	13	30.35	30.21	30.09	10	10	10	12	3	15	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	68	53	38	24	21	16	44	31	18	30.11	29.93	29.73	10	10	10	20	5	25	0.00	
	59	51	42	30	25	18	53	41	28	30.28	30.02	29.71	10	10	10	25	12	33	0.00	
	56	45	33	28	27	25	75	53	30	30.34	30.26	30.17	10	10	10	10	4	13	0.00	
	56	49	42	27	25	22	53	40	27	30.30	30.21	30.14	10	10	10	22	6	27	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Dec	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
	58	50	41	32	28	25	58	47	35	30.16	30.11	30.05	10	10	10	9	3	10	0.00	
	60	49	38	34	32	29	76	57	37	30.23	30.14	30.09	10	10	10	8	3	10	0.00	
	63	50	37	33	31	29	76	53	30	30.08	29.94	29.80	10	10	10	16	4	19	0.00	
	52	45	38	33	13	-7	58	36	14	30.10	29.93	29.78	10	10	10	22	11	27	0.00	
	45	38	30	15	11	-5	47	31	15	30.33	30.25	30.10	10	10	10	21	5	28	0.00	
	48	37	25	11	6	-1	43	31	19	30.38	30.29	30.21	10	10	10	25	12	32	0.00	
	37	30	22	17	12	8	68	50	32	30.45	30.40	30.30	10	10	10	24	10	30	T	Snow
	46	33	19	12	10	7	60	43	25	30.50	30.41	30.32	10	10	10	9	2	11	0.00	
	55	41	26	12	8	4	50	32	14	30.55	30.47	30.40	10	10	10	12	4	14	0.00	
	54	40	26	7	4	1	42	27	12	30.61	30.50	30.41	10	10	10	13	4	15	0.00	
	51	37	23	4	2	-1	44	29	13	30.52	30.44	30.34	10	10	10	21	4	23	0.00	
	54	41	27	6	3	0	37	25	12	30.57	30.40	30.24	10	10	10	24	5	29	0.00	
	55	39	23	8	5	3	42	28	13	30.26	30.11	29.97	10	10	10	10	4	12	0.00	
	47	37	26	15	12	5	43	34	25	30.28	30.11	29.95	10	10	10	31	11	40	0.00	
	48	36	24	18	15	9	68	48	28	30.39	30.26	30.11	10	10	10	10	5	13	0.00	
	47	36	24	18	15	13	63	46	28	30.09	29.90	29.75	10	10	10	14	7	17	0.00	
	52	41	30	31	18	11	76	48	19	30.10	30.00	29.90	10	10	10	16	5	20	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	46	38	30	31	27	21	89	67	45	30.21	30.14	30.06	10	10	10	14	8	17	0.00	
	50	36	21	31	21	11	100	61	21	30.24	30.17	30.09	10	8	0	8	3	9	0.00	Fog
	55	39	23	23	18	12	63	44	24	30.21	30.03	29.80	10	10	10	17	6	22	0.00	
	57	45	32	26	19	11	64	44	24	29.94	29.77	29.60	10	10	10	25	10	35	0.00	
	42	33	23	17	12	7	74	49	24	30.33	30.15	29.94	10	10	10	17	8	21	0.00	
	47	33	19	14	9	7	57	38	19	30.33	30.23	30.13	10	10	10	14	5	14	0.00	
	56	43	30	16	13	9	41	30	18	30.30	30.20	30.14	10	10	10	12	6	16	0.00	
	62	49	35	14	11	5	32	21	10	30.12	30.05	29.95	10	10	10	16	6	19	0.00	
	60	45	30	16	14	8	49	32	15	30.18	30.10	30.01	10	10	10	12	4	15	0.00	
	56	45	33	19	15	11	47	33	18	30.32	30.23	30.16	10	10	10	10	5	13	0.00	
	60	44	28	14	9	2	47	29	11	30.37	30.28	30.21	10	10	10	10	3	13	0.00	
	61	43	24	6	2	-1	33	21	9	30.32	30.24	30.15	10	10	10	10	4	12	0.00	
	61	43	25	6	0	-5	32	20	7	30.27	30.13	30.01	10	10	10	15	6	20	0.00	
	60	45	30	11	3	-2	39	24	9	30.23	30.10	30.01	10	10	10	14	6	17	0.00	

ATTACHMENT B

DAILY WEATHER REPORTS FOR PRECIPITATION EVENTS OCCURRING IN FOURTH QUARTER 2017

Albuquerque, NM

Albuquerque International Sunport

8:15 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

4

2017

View
Wednesday, October 4, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**73** °F	**62** °F	
Max Temperature	**82** °F	**74** °F	**87** °F (1947)
Min Temperature	**63** °F	**51** °F	**32** °F (1915)
Degree Days			
Heating Degree Days	0	4	
Month to date heating degree days	0	13	
Since 1 July heating degree days	21	39	
Cooling Degree Days	8	1	

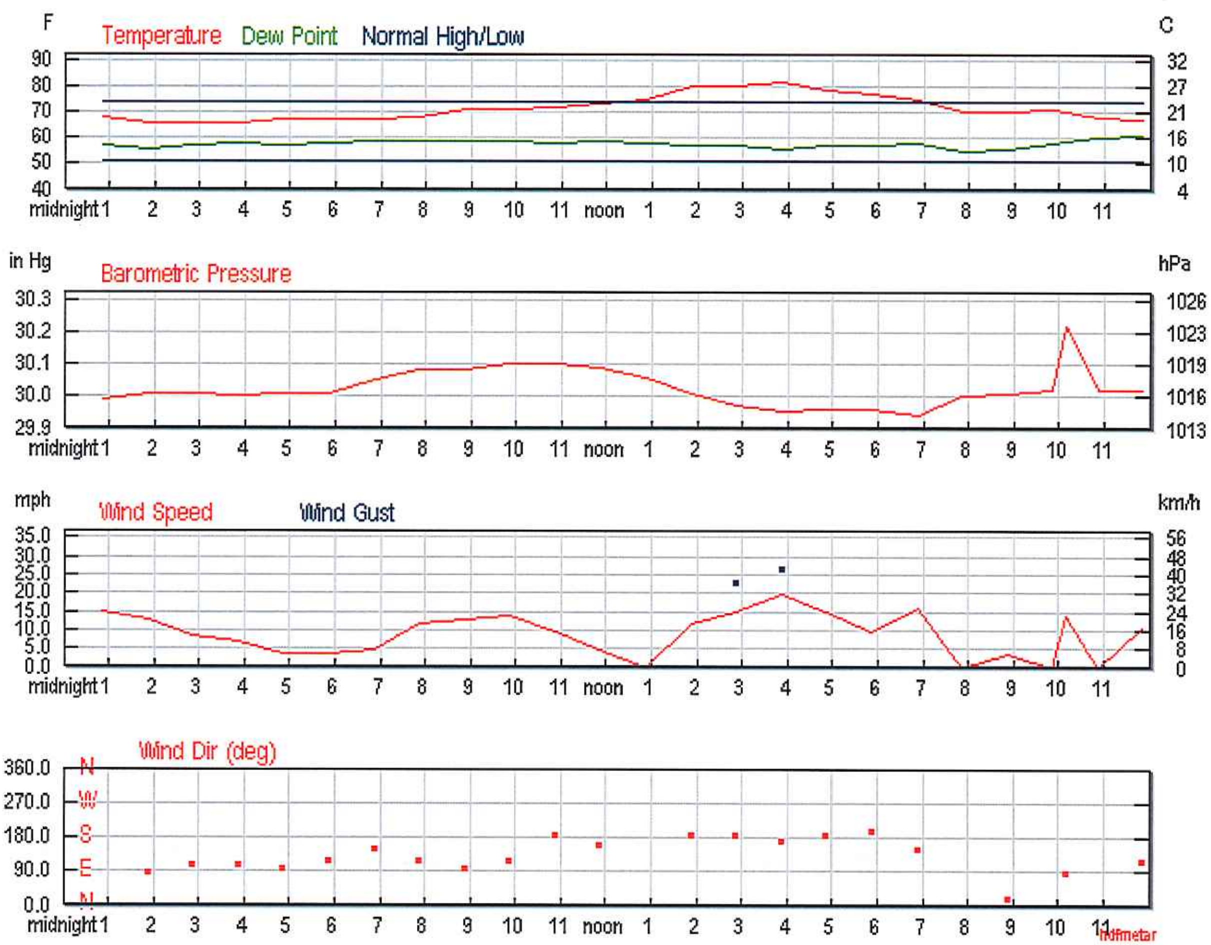
	Actual	Average	Record
Month to date cooling degree days	13	4	
Year to date cooling degree days	1543	1316	
Growing Degree Days	24 (Base 50)		
Moisture			
Dew Point	**58** °F		
Average Humidity	59		
Maximum Humidity	78		
Minimum Humidity	40		
Precipitation			
Precipitation	**0.02** in	**0.04** in	**1.75** in (1911)
Month to date precipitation	0.02	0.17	
Year to date precipitation	7.65	7.53	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**30.02** in		
Wind			
Wind Speed	**9** mph (SE)		
Max Wind Speed	**23** mph		

	Actual	Average	Record
Max Gust Speed	**28** mph		
Visibility	**10** miles		
Events	Rain , Thunderstorm		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

4

Submit

Astronomy

Oct. 04, 2017	**Rise**	**Set**
Actual Time	7:03 AM MDT	6:45 PM MDT
Civil Twilight	6:38 AM MDT	7:10 PM MDT
Nautical Twilight	6:09 AM MDT	7:40 PM MDT
Astronomical Twilight	5:39 AM MDT	8:09 PM MDT

Moon	6:31 PM MDT (10/4)	5:45 AM MDT (10/4)
Length of Visible Light	12h 32m	
Length of Day	11h 41m	

Waxing Gibbous, 99% of the Moon is Illuminated

Oct 4	Oct 5	Oct 12	Oct 19	Oct 27
Waxing Gibbous	Full	Last Quarter	New	First Quarter

Hourly Weather History & Observations

Time (MDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**68.0** °F	-	**57.0** °F	68%	**29.99** in	**10.0** mi	East	**15.0** mph	-	N/A		Partly Cloudy
	METAR KABQ 040652Z 10013KT 10SM FEW090 FEW150 20/14 A3022 RMK AO2 SLP156 T02000139 402720100											
1:52 AM	**66.0** °F	-	**55.9** °F	70%	**30.01** in	**10.0** mi	East	**12.7** mph	-	N/A		Partly Cloudy
	METAR KABQ 040752Z 09011KT 10SM FEW090 FEW150 19/13 A3023 RMK AO2 SLP163 T01890133											
2:52 AM	**66.0** °F	-	**57.0** °F	73%	**30.01** in	**10.0** mi	ESE	**8.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 040852Z 11007KT 10SM FEW045 SCT080 19/14 A3024 RMK AO2 SLP162 MTN TOPS OBSC NE T01890139 51006											
3:52 AM	**66.0** °F	-	**57.9** °F	75%	**30.00** in	**10.0** mi	ESE	**6.9** mph	-	N/A		Mostly Cloudy
	METAR KABQ 040952Z 11006KT 10SM SCT050 BKN080 19/14 A3024 RMK AO2 SLP159 MTN TOPS OBSC NE T01890144											
4:52 AM	**66.9** °F	-	**57.0** °F	70%	**30.01** in	**10.0** mi	East	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041052Z 10003KT 10SM BKN040 BKN080 19/14 A3024 RMK AO2 SLP160 MTNS OBSC NE AND SE T01940139											
5:52 AM	**66.9** °F	-	**57.9** °F	73%	**30.01** in	**10.0** mi	ESE	**3.5** mph	-	N/A		Overcast
	METAR KABQ 041152Z 12003KT 10SM FEW020 BKN030 OVC080 19/14 A3025 RMK AO2 SLP163 VIRGA W MTNS OBSC NE-SE SHRA DSNT SE T01940144 10200 20183 53005											
6:52 AM	**66.9** °F	-	**59.0** °F	76%	**30.05** in	**10.0** mi	SSE	**4.6** mph	-	N/A		Overcast
	METAR KABQ 041252Z 15004KT 10SM FEW015 BKN033 OVC070 19/15 A3027 RMK AO2 SLP174 VIRGA E CB DSNT NE-E MTNS OBSC NE-SE SHRA DSNT E T01940150											
7:52 AM	**68.0** °F	-	**59.0** °F	73%	**30.08** in	**10.0** mi	ESE	**11.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041352Z 12010KT 10SM FEW020 BKN035 BKN065 20/15 A3029 RMK AO2 SLP185 TCU DSNT NE AND SE-S MTNS OBSC NE AND SE T02000150											
8:52 AM	**71.1** °F	-	**59.0** °F	66%	**30.08** in	**10.0** mi	East	**12.7** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041452Z 10011KT 10SM FEW020 BKN037 22/15 A3030 RMK AO2 SLP186 MTNS OBSC NE AND SE T02170150 51014											

Time (MDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
9:52 AM	**71.1** °F	-	**59.0** °F	66%	**30.10** in	**10.0** mi	ESE	**13.8** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041552Z 12012KT 10SM FEW030 BKN037 22/15 A3031 RMK AO2 SLP191 MTN TOPS OBSC NE AND SE T02170150											
10:52 AM	**72.0** °F	-	**57.9** °F	61%	**30.10** in	**10.0** mi	South	**9.2** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041652Z 19008KT 10SM FEW030 BKN037 BKN046 22/14 A3032 RMK AO2 SLP193 MTN TOPS OBSC NE AND SE T02220144											
11:52 AM	**73.0** °F	-	**59.0** °F	61%	**30.09** in	**10.0** mi	SSE	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041752Z 16004KT 10SM BKN039 BKN050 23/15 A3031 RMK AO2 SLP187 MTN TOPS OBSC NE AND SE T02280150 10228 20194 50001											
12:52 PM	**75.0** °F	-	**57.9** °F	55%	**30.06** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 041852Z 00000KT 10SM BKN044 BKN060 24/14 A3028 RMK AO2 LTG DSNT SE SLP177 MTN TOPS OBSC NE AND SE T02390144											
1:52 PM	**80.1** °F	**80.4** °F	**57.0** °F	45%	**30.01** in	**10.0** mi	South	**11.5** mph	**18.4** mph	N/A		Mostly Cloudy
	METAR KABQ 041952Z 19010G16KT 10SM SCT045 BKN060 BKN110 27/14 A3024 RMK AO2 LTG DSNT E SLP162 CB DSNT SE MTN TOP OBSC NE T02670139											
2:52 PM	**80.1** °F	**80.4** °F	**57.0** °F	45%	**29.97** in	**10.0** mi	South	**15.0** mph	**23.0** mph	N/A		Mostly Cloudy
	METAR KABQ 042052Z 19013G20KT 10SM FEW045 BKN055 BKN110 BKN250 27/14 A3020 RMK AO2 SLP148 MTN TOP OBSC NE T02670139 58029											
3:52 PM	**82.0** °F	**81.6** °F	**55.9** °F	41%	**29.95** in	**10.0** mi	South	**19.6** mph	**26.5** mph	N/A		Mostly Cloudy
	METAR KABQ 042152Z 17017G23KT 10SM BKN055 BKN090 BKN250 28/13 A3019 RMK AO2 LTG DSNT W AND NW SLP140 T02780133											
4:52 PM	**79.0** °F	-	**57.0** °F	47%	**29.96** in	**10.0** mi	South	**15.0** mph	-	N/A		Mostly Cloudy
	METAR KABQ 042252Z 19013KT 10SM FEW055 BKN110 BKN250 26/14 A3019 RMK AO2 LTG DSNT NW-NE SLP143 T02610139											
5:52 PM	**77.0** °F	-	**57.0** °F	50%	**29.96** in	**10.0** mi	SSW	**9.2** mph	-	N/A		Mostly Cloudy
	METAR KABQ 042352Z 20008KT 10SM FEW050 SCT090 BKN200 25/14 A3019 RMK AO2 LTG DSNT N AND NE AND SW SLP144 SHRA DSNT SW MTN TOPS OBSC NE T02500139 10278 20228 56005											
6:52 PM	**75.0** °F	-	**57.9** °F	55%	**29.94** in	**10.0** mi	SSE	**16.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 050052Z 15014KT 10SM FEW050 SCT110 BKN200 24/14 A3017 RMK AO2 LTG DSNT S SLP139 VCSH SE MTNS OBSC NE-SE T02390144											
7:52 PM	**70.0** °F	-	**55.0** °F	59%	**30.00** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy

Time (MDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 050152Z 00000KT 10SM FEW050 SCT110 BKN200 21/13 A3021 RMK AO2 LTG DSNT E SLP158 CB DSNT NE-E T02110128											
8:52 PM	**70.0** °F	-	**55.9** °F	61%	**30.01** in	**10.0** mi	NNE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 050252Z 02003KT 10SM FEW055 SCT090 BKN200 21/13 A3023 RMK AO2 SLP162 T02110133 53013											
9:52 PM	**71.1** °F	-	**57.9** °F	63%	**30.02** in	**10.0** mi	Calm	Calm	-	**0.00** in	Thunderstorm	Mostly Cloudy
	METAR KABQ 050352Z 00000KT 10SM VCTS FEW048 SCT085CB BKN110 BKN200 22/14 A3024 RMK AO2 LTG DSNT SE AND S RAB03E39 SLP165 TS E MOV NE MTNS OBSC NE-SE P0000 T02170144											
10:09 PM	**70.0** °F	-	**59.0** °F	68%	**30.22** in	**10.0** mi	East	**13.8** mph	-	N/A		Mostly Cloudy
	SPECI KABQ 050409Z 09012KT 10SM FEW050 SCT085 BKN110 BKN200 21/15 A3022 RMK AO2 LTG DSNT E AND S MTNS OBSC NE-SE T02110150											
10:52 PM	**68.0** °F	-	**60.1** °F	76%	**30.02** in	**10.0** mi	Calm	Calm	-	**0.00** in		Mostly Cloudy
	METAR KABQ 050452Z 00000KT 10SM FEW050 SCT085 BKN110 BKN200 20/16 A3024 RMK AO2 LTG DSNT E-SW RAB16E30 SLP166 CB DSNT SE-SW MTN TOPS OBSC NE P0000 T02000156											
11:52 PM	**66.9** °F	-	**61.0** °F	81%	**30.02** in	**10.0** mi	ESE	**10.4** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 050552Z 12009KT 10SM -RA SCT050 BKN090 OVC200 19/16 A3023 RMK AO2 LTG DSNT E-SW RAB36 SLP164 CB DSNT E-S MTNS OBSC NE P0000 60000 T01940161 10250 20189 58001											

Albuquerque, NM

Albuquerque International Sunport

8:16 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

5

2017

View
Thursday, October 5, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**70** °F	**62** °F	
Max Temperature	**77** °F	**73** °F	**91** °F (1979)
Min Temperature	**62** °F	**50** °F	**34** °F (1932)
Degree Days			
Heating Degree Days	0	4	
Month to date heating degree days	0	17	
Since 1 July heating degree days	21	43	
Cooling Degree Days	5	1	

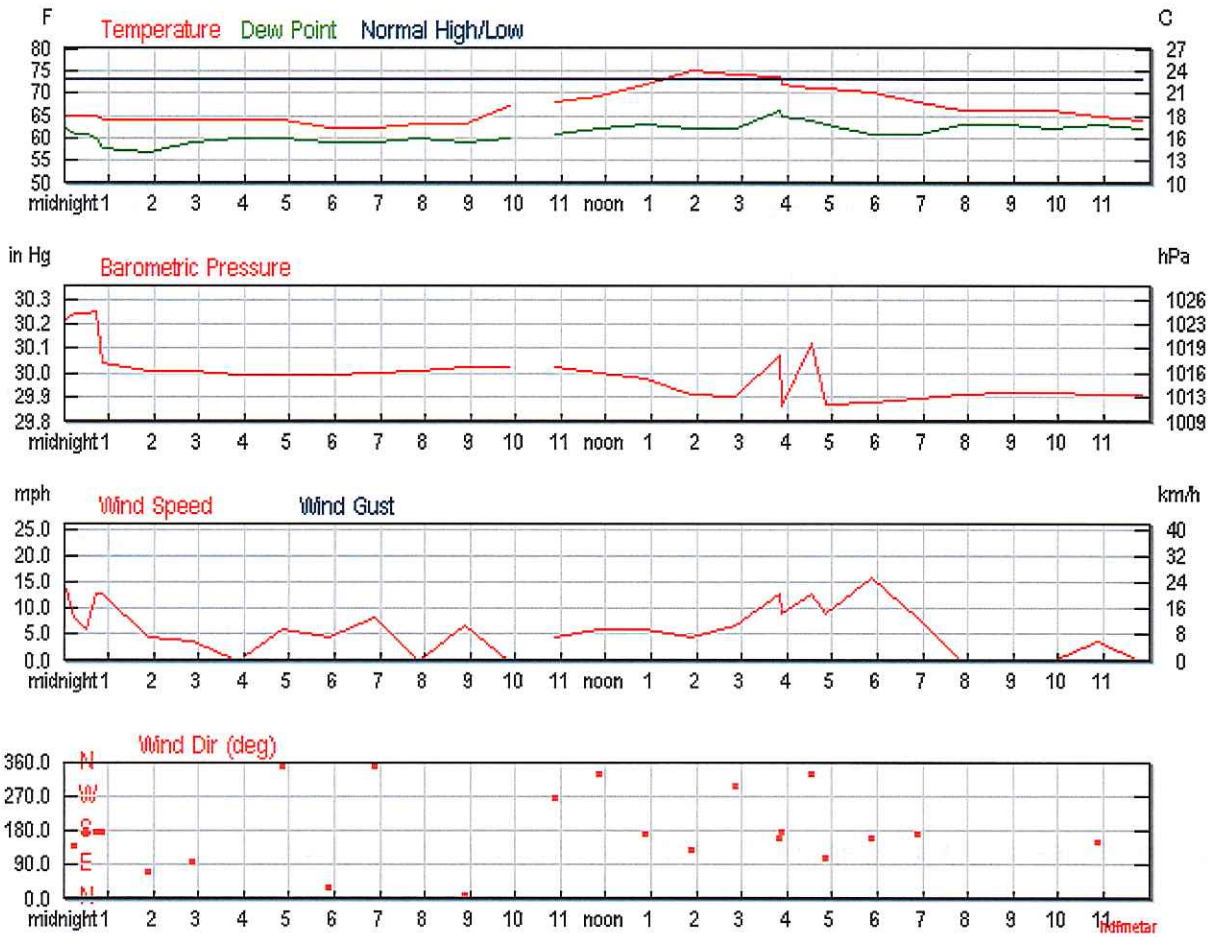
	Actual	Average	Record
Month to date cooling degree days	18	5	
Year to date cooling degree days	1548	1317	
Growing Degree Days	20 (Base 50)		
Moisture			
Dew Point	**61** °F		
Average Humidity	79		
Maximum Humidity	93		
Minimum Humidity	64		
Precipitation			
Precipitation	**0.02** in	**0.04** in	**0.80** in (1901)
Month to date precipitation	0.04	0.21	
Year to date precipitation	7.67	7.57	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**29.99** in		
Wind			
Wind Speed	**5** mph (SE)		
Max Wind Speed	**17** mph		

	Actual	Average	Record
Max Gust Speed	**22** mph		
Visibility	**10** miles		
Events	Rain , Thunderstorm		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



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KABQ

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Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

5

Submit

Astronomy

Oct. 05, 2017	**Rise**	**Set**
Actual Time	7:04 AM MDT	6:44 PM MDT
Civil Twilight	6:39 AM MDT	7:09 PM MDT
Nautical Twilight	6:09 AM MDT	7:38 PM MDT
Astronomical Twilight	5:40 AM MDT	8:08 PM MDT

Moon	7:07 PM MDT (10/5)	6:49 AM MDT (10/5)
Length of Visible Light	12h 30m	
Length of Day	11h 39m	

Full, 100% of the Moon is Illuminated

Oct 5	Oct 5	Oct 12	Oct 19	Oct 27
Full	Full	Last Quarter	New	First Quarter

Hourly Weather History & Observations

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:04 AM	**64.9** °F	**62.1** °F	90%	**30.22** in	**7.0** mi	ESE	**13.8** mph	-	**0.02** in	Rain , Thunderstorm	Light Rain
	SPECI KABQ 050604Z 11012KT 7SM VCTS -RA SCT050CB BKN080 OVC120 18/17 A3022 RMK AO2 LTG DSNT E-S FRQ LTGCGICCA VC S TS S MOV NE CB DSNT E MTNS OBSC NE P0002 T01830167										
12:14 AM	**64.9** °F	**61.0** °F	87%	**30.24** in	**10.0** mi	SE	**8.1** mph	-	**0.02** in	Rain , Thunderstorm	Light Thunderstorms and Rain
	SPECI KABQ 050614Z 14007KT 10SM -TSRA SCT050CB BKN080 OVC120 18/16 A3024 RMK AO2 LTG DSNT E-S TSB13 CONS LTGCGICCA SE-S TS SE-S MOV NE CB DSNT E AND SW MTNS OBSC NE P0002 T01830161										
12:30 AM	**64.9** °F	**61.0** °F	87%	**30.24** in	**10.0** mi	South	**5.8** mph	-	**0.02** in	Rain , Thunderstorm	Light Thunderstorms and Rain
	SPECI KABQ 050630Z COR 18005KT 10SM -TSRA FEW002 SCT050CB BKN080 OVC140 18/16 A3024 RMK AO2 LTG DSNT E-S TSB13 FRQ LTGCGICCA E-SE TS E-SE MOV NE CB DSNT E AND S MTNS OBSC NE VCSH E-S P0002 T01830161										
12:44 AM	**64.9** °F	**60.1** °F	84%	**30.25** in	**10.0** mi	South	**12.7** mph	-	**0.02** in		Overcast
	SPECI KABQ 050644Z 18011KT 10SM FEW004 SCT045 BKN080 OVC140 18/16 A3025 RMK AO2 LTG DSNT E-S RAE35 TSB13E44 FRQ LTGCGICCA DSNT E-S CB DSNT E-S MTNS OBSC NE SHRA E-S P0002 T01830156										
12:52 AM	**64.0** °F	**57.9** °F	80%	**30.04** in	**10.0** mi	South	**12.7** mph	-	**0.02** in		Overcast
	METAR KABQ 050652Z 18011KT 10SM FEW004 SCT045 BKN080 OVC140 18/14 A3025 RMK AO2 LTG DSNT E-S RAE35 TSB13E44 SLP170 CB DSNT E-S MTNS OBSC NE P0002 T01780144 402780178										
1:52 AM	**64.0** °F	**57.0** °F	78%	**30.01** in	**10.0** mi	ENE	**4.6** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 050752Z 07004KT 10SM -RA FEW006 FEW040 SCT080 BKN150 OVC200 18/14 A3023 RMK AO2 LTG DSNT SE RAB41 SLP161 CB DSNT NE-SE AND S MTNS OBSC NE-SE P0000 T01780139										
2:52 AM	**64.0** °F	**59.0** °F	84%	**30.01** in	**10.0** mi	East	**3.5** mph	-	**0.00** in		Mostly Cloudy

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 050852Z 10003KT 10SM FEW040 SCT100 BKN150 BKN210 18/15 A3023 RMK AO2 RAE0758 SLP160 CB DSNT NE-E MTNS OBSC NE AND SE P0000 60002 T01780150 50000										
3:52 AM	**64.0** °F	**60.1** °F	87%	**29.99** in	**10.0** mi	Calm	Calm	-	N/A		Scattered Clouds
	METAR KABQ 050952Z 00000KT 10SM FEW040 SCT110 SCT170 18/16 A3022 RMK AO2 SLP153 CB DSNT SE MTN TOPS OBSC NE AND SE T01780156										
4:52 AM	**64.0** °F	**60.1** °F	87%	**29.99** in	**10.0** mi	North	**5.8** mph	-	N/A		Scattered Clouds
	METAR KABQ 051052Z 35005KT 10SM FEW035 FEW070 SCT110 SCT160 18/16 A3021 RMK AO2 SLP153 MTN TOPS OBSC NE AND SE T01780156										
5:52 AM	**62.1** °F	**59.0** °F	90%	**29.99** in	**10.0** mi	NNE	**4.6** mph	-	N/A		Scattered Clouds
	METAR KABQ 051152Z 03004KT 10SM FEW035 SCT070 SCT100 17/15 A3020 RMK AO2 SLP154 CB DSNT W MTN TOPS OBSC NE AND SE 60002 70002 T01670150 10194 20167 56009										
6:52 AM	**62.1** °F	**59.0** °F	90%	**30.00** in	**10.0** mi	North	**8.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 051252Z 35007KT 10SM SCT040 SCT100 17/15 A3021 RMK AO2 SLP158 CB DSNT W-NW MTNS OBSC NE AND SE T01670150										
7:52 AM	**63.0** °F	**60.1** °F	90%	**30.01** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 051352Z COR 00000KT 10SM SCT028 BKN080 17/16 A3021 RMK AO2 LTG DSNT N SLP162 CB DSNT NW-N MTNS OBSC NE AND SE SHRA DSNT SE T01720156										
8:52 AM	**63.0** °F	**59.0** °F	87%	**30.02** in	**10.0** mi	North	**6.9** mph	-	N/A		Mostly Cloudy
	METAR KABQ 051452Z 01006KT 10SM SCT024 BKN090 17/15 A3022 RMK AO2 SLP165 MTN TOPS OBSC NE AND SE T01720150 53005										
9:52 AM	**66.9** °F	**60.1** °F	79%	**30.02** in	**10.0** mi	Calm	Calm	-	**0.00** in		Overcast
	METAR KABQ 051552Z 00000KT 10SM FEW044 BKN070 OVC090 19/16 A3023 RMK AO2 LTG DSNT N AND NW RAB25E38 SLP164 VCSH NE MTN TOPS OBSC NE AND SE P0000 T01940156										
10:18 AM	-	-	N/A%	-	-	North	-	-	N/A		Unknown
	METAR KABQ 051618 MTRCQC										

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
10:52 AM	**68.0** °F	**61.0** °F	78%	**30.02** in	**10.0** mi	West	**4.6** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 051652Z 27004KT 10SM -RA FEW020 BKN060 BKN090 20/16 A3022 RMK AO2 RAB1555E01B49 SLP165 MTN TOPS OBSC NE AND SE P0000 T02000161										
11:52 AM	**69.1** °F	**62.1** °F	78%	**30.00** in	**10.0** mi	NNW	**5.8** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 051752Z 33005KT 10SM FEW022 BKN031 BKN060 21/17 A3020 RMK AO2 RAE20 SLP158 MTN TOPS OBSC NE AND SE P0000 60000 T02060167 10206 20167 58005										
12:52 PM	**72.0** °F	**63.0** °F	73%	**29.97** in	**10.0** mi	South	**5.8** mph	-	N/A		Mostly Cloudy
	METAR KABQ 051852Z 17005KT 10SM FEW025TCU BKN060 BKN240 22/17 A3018 RMK AO2 SLP149 TCU NE-E MTN TOPS OBSC NE AND SE T02220172										
1:52 PM	**75.0** °F	**62.1** °F	64%	**29.91** in	**10.0** mi	SE	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 051952Z 13004KT 10SM SCT040 SCT110 SCT150 BKN250 24/17 A3013 RMK AO2 SLP127 MTN TOPS OBSC NE AND SE T02390167										
2:52 PM	**73.9** °F	**62.1** °F	66%	**29.90** in	**10.0** mi	WNW	**6.9** mph	-	N/A		Mostly Cloudy
	METAR KABQ 052052Z 30006KT 10SM SCT030 SCT100 BKN220 23/17 A3011 RMK AO2 LTG DSNT SW SLP125 CB DSNT W-NW TCU DSNT SE SHRA DSNT SW-NW MTN TOPS OBSC NE AND SE T02330167 56026										
3:50 PM	**73.4** °F	**66.2** °F	78%	**30.07** in	**7.0** mi	SSE	**12.7** mph	-	**0.02** in	Rain , Thunderstorm	Light Rain
	SPECI KABQ 052150Z 16011KT 7SM VCTS -RA FEW050 BKN080CB BKN100 23/19 A3007 RMK AO2 LTG DSNT ALQDS RAB09 TSE44 OCNL LTGCG VC S TS S MOV E MTN TOPS OBSC NE P0002										
3:52 PM	**72.0** °F	**64.9** °F	78%	**29.86** in	**7.0** mi	South	**9.2** mph	-	**0.02** in	Rain , Thunderstorm	Light Rain
	METAR KABQ 052152Z 18008KT 7SM VCTS -RA FEW050 BKN080CB BKN100 22/18 A3007 RMK AO2 LTG DSNT ALQDS RAB09 TSE44 SLP112 OCNL LTGCG VC S TS S MOV E MTN TOPS OBSC NE P0002 T02220183										
4:33 PM	**71.1** °F	**64.0** °F	78%	**30.12** in	**10.0** mi	NNW	**12.7** mph	-	**0.00** in		Mostly Cloudy
	SPECI KABQ 052233Z 33011KT 10SM SCT025 BKN045 BKN110 BKN200 22/18 A3012 RMK AO2 LTG DSNT ALQDS RAE33 MTNS OBSC NE-SE P0000 T02170178										
4:52 PM	**71.1** °F	**63.0** °F	75%	**29.87** in	**10.0** mi	ESE	**9.2** mph	-	**0.00** in	Rain	Light Rain

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 052252Z 11008KT 10SM -RA FEW027 BKN070 BKN110 BKN200 22/17 A3008 RMK AO2 LTG DSNT ALQDS RAE33B38 SLP115 CB DSNT SW MTNS OBSC NE-SE P0000 T02170172										
5:52 PM	**70.0** °F	**61.0** °F	73%	**29.88** in	**10.0** mi	SSE	**16.1** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 052352Z 16014KT 10SM FEW030 SCT070 BKN140 BKN200 21/16 A3008 RMK AO2 LTG DSNT S AND SW RAE00 SLP119 CB DSNT SE SHRA DSNT E-SE MTNS OBSC SE P0000 60002 T02110161 10250 20206 50003										
6:52 PM	**68.0** °F	**61.0** °F	78%	**29.89** in	**10.0** mi	South	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 060052Z 17007KT 10SM SCT060 BKN120 BKN200 20/16 A3008 RMK AO2 LTG DSNT SE AND S SLP120 CB DSNT SE-SW SHRA DSNT SE-SW MTNS OBSC SE T02000161										
7:52 PM	**66.0** °F	**63.0** °F	90%	**29.91** in	**10.0** mi	Calm	Calm	-	**0.00** in	Rain	Light Rain
	METAR KABQ 060152Z 00000KT 10SM -RA SCT065 BKN110 BKN200 19/17 A3009 RMK AO2 LTG DSNT S-W RAB42 SLP126 MTNS OBSC NE-SE P0000 T01890172										
8:52 PM	**66.0** °F	**63.0** °F	90%	**29.92** in	**10.0** mi	Calm	Calm	-	**0.00** in		Mostly Cloudy
	METAR KABQ 060252Z 00000KT 10SM FEW070 BKN110 BKN200 19/17 A3011 RMK AO2 LTG DSNT SE AND S RAE18 SLP132 P0000 60000 T01890172 53009										
9:52 PM	**66.0** °F	**62.1** °F	87%	**29.92** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 060352Z 00000KT 10SM FEW070 BKN095 BKN200 19/17 A3012 RMK AO2 SLP132 T01890167										
10:52 PM	**64.9** °F	**63.0** °F	93%	**29.91** in	**10.0** mi	SSE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 060452Z 15003KT 10SM FEW070 SCT100 BKN200 18/17 A3011 RMK AO2 SLP128 T01830172										
11:52 PM	**64.0** °F	**62.1** °F	93%	**29.91** in	**10.0** mi	Calm	Calm	-	N/A		Scattered Clouds
	METAR KABQ 060552Z 00000KT 10SM FEW070 SCT110 SCT200 18/17 A3011 RMK AO2 SLP128 60000 T01780167 10206 20178 51000										

Albuquerque, NM

Albuquerque International Sunport

8:17 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

6

2017

View
Friday, October 6, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**68** °F	**61** °F	
Max Temperature	**80** °F	**73** °F	**87** °F (1956)
Min Temperature	**56** °F	**50** °F	**29** °F (1915)
Degree Days			
Heating Degree Days	0	4	
Month to date heating degree days	0	21	
Since 1 July heating degree days	21	47	
Cooling Degree Days	3	1	

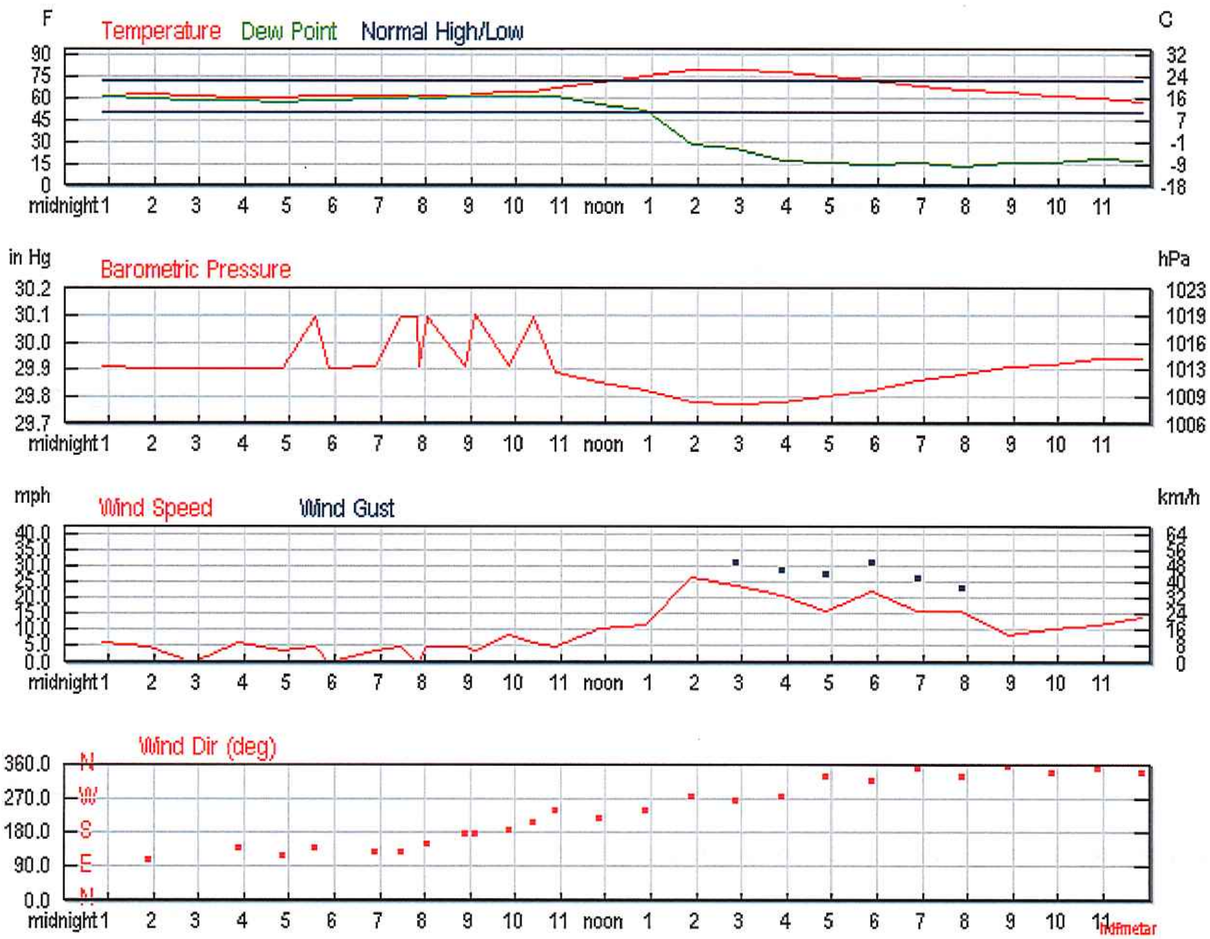
	Actual	Average	Record
Month to date cooling degree days	21	6	
Year to date cooling degree days	1551	1318	
Growing Degree Days	19 (Base 50)		
Moisture			
Dew Point	**43** °F		
Average Humidity	55		
Maximum Humidity	100		
Minimum Humidity	10		
Precipitation			
Precipitation	**T** in	**0.04** in	**1.15** in (1901)
Month to date precipitation	0.04	0.25	
Year to date precipitation	7.67	7.61	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**29.91** in		
Wind			
Wind Speed	**11** mph (SW)		
Max Wind Speed	**28** mph		

	Actual	Average	Record
Max Gust Speed	**42** mph		
Visibility	**10** miles		
Events	Rain		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



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Airport or City:

KABQ

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Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

6

Submit

Astronomy

Oct. 06, 2017	**Rise**	**Set**
Actual Time	7:05 AM MDT	6:42 PM MDT
Civil Twilight	6:40 AM MDT	7:08 PM MDT
Nautical Twilight	6:10 AM MDT	7:37 PM MDT
Astronomical Twilight	5:41 AM MDT	8:06 PM MDT
Moon	7:45 PM MDT (10/6)	7:54 AM MDT (10/6)
Length of Visible Light	12h 28m	
Length of Day	11h 37m	

Full, 99% of the Moon is Illuminated

Oct 6	Oct 12	Oct 19	Oct 27	Nov 3
Full	Last Quarter	New	First Quarter	Full

Hourly Weather History & Observations

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**62.1** °F	**62.1** °F	100%	**29.91** in	**10.0** mi	ESE	**5.8** mph	-	N/A		Scattered Clouds
	METAR KABQ 060652Z 12005KT 10SM FEW040 FEW070 SCT110 SCT200 17/17 A3011 RMK AO2 SLP129 CB DSNT SE MTN TOPS OBSC NE AND SE T01670167 402500167										
1:52 AM	**63.0** °F	**60.1** °F	90%	**29.90** in	**10.0** mi	ESE	**4.6** mph	-	N/A		Scattered Clouds
	METAR KABQ 060752Z 11004KT 10SM FEW040 FEW090 SCT110 17/16 A3011 RMK AO2 SLP125 CONS LTGCGCC DSNT E-SE AND S CB DSNT E-SE AND S MTN TOPS OBSC NE AND SE T01720156										
2:52 AM	**61.0** °F	**59.0** °F	93%	**29.90** in	**10.0** mi	Calm	Calm	-	N/A		Scattered Clouds
	METAR KABQ 060852Z 00000KT 10SM FEW040 FEW080 SCT110 16/15 A3010 RMK AO2 SLP123 MTN TOPS OBSC NE T01610150 58003										
3:52 AM	**60.1** °F	**59.0** °F	96%	**29.90** in	**10.0** mi	SE	**5.8** mph	-	N/A		Scattered Clouds
	METAR KABQ 060952Z 14005KT 10SM FEW040 FEW075 SCT100 16/15 A3010 RMK AO2 SLP125 MTN TOPS OBSC NE AND SE T01560150										
4:52 AM	**60.1** °F	**57.9** °F	93%	**29.90** in	**10.0** mi	ESE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 061052Z 12003KT 10SM FEW030 FEW060 SCT079 BKN130 16/14 A3009 RMK AO2 SLP123 MTN TOPS OBSC NE T01560144										
5:34 AM	**61.0** °F	**59.0** °F	93%	**30.09** in	**10.0** mi	SE	**4.6** mph	-	N/A		Mostly Cloudy
	SPECI KABQ 061134Z 14004KT 10SM FEW001 FEW020 BKN080 BKN130 16/15 A3009 RMK AO2 MTNS OBSC NE-SE T01610150										
5:52 AM	**61.0** °F	**59.0** °F	93%	**29.90** in	**10.0** mi	Calm	Calm	-	**0.00** in	Rain	Light Rain
	METAR KABQ 061152Z 00000KT 10SM -RA FEW001 FEW020 SCT080 BKN130 16/15 A3009 RMK AO2 RAB35 SLP123 MTNS OBSC NE-SE P0000 60000 70002 T01610150 10178 20156 56004										
6:52 AM	**62.1** °F	**60.1** °F	93%	**29.91** in	**10.0** mi	SE	**3.5** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 061252Z 13003KT 10SM FEW013 SCT030 BKN080 BKN130 17/16 A3009 RMK AO2 RAE1159 SLP126 MTNS OBSC NE-SE P0000 T01670156										
7:27 AM	**62.1** °F	**60.1** °F	93%	**30.09** in	**10.0** mi	SE	**4.6** mph	-	N/A		Overcast
	SPECI KABQ 061327Z 13004KT 10SM SCT009 SCT030 BKN080 OVC130 17/16 A3009 RMK AO2 MTNS OBSC NE-SE T01670156										

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
7:50 AM	**60.8** °F	**60.8** °F	100%	**30.09** in	**8.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	SPECI KABQ 061350Z 00000KT 8SM SCT007 BKN080 16/16 A3009 RMK AO2 MTNS OBSC NE-SE										
7:52 AM	**61.0** °F	**60.1** °F	97%	**29.91** in	**8.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 061352Z 00000KT 8SM SCT007 BKN080 16/16 A3009 RMK AO2 SLP128 MTNS OBSC NE-SE T01610156										
8:01 AM	**61.0** °F	**60.1** °F	97%	**30.09** in	**10.0** mi	SSE	**4.6** mph	-	N/A		Mostly Cloudy
	SPECI KABQ 061401Z 15004KT 10SM BKN007 BKN080 16/16 A3009 RMK AO2 MTNS OBSC NE-SE T01610156										
8:52 AM	**62.1** °F	**62.1** °F	100%	**29.91** in	**10.0** mi	South	**4.6** mph	-	N/A		Overcast
	METAR KABQ 061452Z 18004KT 10SM BKN007 OVC085 17/17 A3010 RMK AO2 SLP128 MTNS OBSC NE-SE 60000 T01670167 51002										
9:06 AM	**63.0** °F	**62.1** °F	97%	**30.10** in	**10.0** mi	South	**3.5** mph	-	N/A		Overcast
	SPECI KABQ 061506Z 18003KT 10SM OVC005 17/17 A3010 RMK AO2 MTNS OBSC NE-SE T01720167										
9:52 AM	**64.0** °F	**62.1** °F	93%	**29.91** in	**10.0** mi	South	**8.1** mph	-	N/A		Overcast
	METAR KABQ 061552Z 19007KT 10SM OVC006 18/17 A3010 RMK AO2 SLP127 MTNS OBSC NE-SE T01780167										
10:24 AM	**64.9** °F	**62.1** °F	90%	**30.09** in	**10.0** mi	SSW	**5.8** mph	-	N/A		Partly Cloudy
	SPECI KABQ 061624Z 21005KT 10SM FEW006 FEW090 18/17 A3009 RMK AO2 T01830167										
10:52 AM	**66.9** °F	**61.0** °F	81%	**29.89** in	**10.0** mi	WSW	**4.6** mph	-	N/A		Partly Cloudy
	METAR KABQ 061652Z 24004KT 10SM FEW030 19/16 A3009 RMK AO2 SLP122 MTN TOPS OBSC NE-SE T01940161										
11:52 AM	**71.1** °F	**55.9** °F	59%	**29.85** in	**10.0** mi	SW	**10.4** mph	-	N/A		Partly Cloudy
	METAR KABQ 061752Z COR 22009KT 10SM FEW040 FEW060 22/13 A3006 RMK AO2 SLP108 MTN TOPS OBSC SE 60000 T02170133 10217 20161 58010										
12:52 PM	**75.9** °F	**52.0** °F	43%	**29.82** in	**10.0** mi	WSW	**11.5** mph	-	N/A		Scattered Clouds
	METAR KABQ 061852Z 24010KT 10SM SCT055 24/11 A3003 RMK AO2 SLP097 T02440111										
1:52 PM	**79.0** °F	**28.0** °F	15%	**29.78** in	**10.0** mi	West	**26.5** mph	**32.2** mph	N/A		Partly Cloudy
	METAR KABQ 061952Z 28023G28KT 10SM FEW090 26/M02 A3001 RMK AO2 PK WND 30037/1917 SLP084 T02611022										
2:52 PM	**79.0** °F	**25.0** °F	14%	**29.77** in	**10.0** mi	West	**24.2** mph	**31.1** mph	N/A		Partly Cloudy

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 062052Z 27021G27KT 10SM FEW100 26/M04 A2999 RMK AO2 PK WND 26029/2039 SLP079 CB DSNT SE T02611039 56021										
3:52 PM	**78.1** °F	**17.1** °F	10%	**29.78** in	**10.0** mi	West	**20.7** mph	**28.8** mph	N/A		Partly Cloudy
	METAR KABQ 062152Z 28018G25KT 10SM FEW120 26/M08 A2999 RMK AO2 PK WND 25029/2101 SLP082 CB DSNT SE T02561083										
4:52 PM	**75.9** °F	**16.0** °F	10%	**29.80** in	**10.0** mi	NNW	**16.1** mph	**27.6** mph	N/A		Partly Cloudy
	METAR KABQ 062252Z 33014G24KT 10SM FEW070 24/M09 A3001 RMK AO2 PK WND 31028/2239 SLP089 T02441089										
5:52 PM	**72.0** °F	**14.0** °F	11%	**29.82** in	**10.0** mi	NW	**21.9** mph	**31.1** mph	N/A		Partly Cloudy
	METAR KABQ 062352Z 32019G27KT 10SM FEW070 22/M10 A3003 RMK AO2 PK WND 34029/2336 SLP098 T02221100 10267 20217 53012										
6:52 PM	**68.0** °F	**15.8** °F	13%	**29.86** in	**10.0** mi	North	**16.1** mph	**26.5** mph	N/A		Partly Cloudy
	METAR KABQ 070052Z 35014G23KT 10SM FEW080 20/M09 A3005 RMK AO2 PK WND 30028/0014 SLP109 FU FEW080 T02001094										
7:52 PM	**66.0** °F	**12.9** °F	13%	**29.88** in	**10.0** mi	NNW	**16.1** mph	**23.0** mph	N/A		Clear
	METAR KABQ 070152Z 33014G20KT 10SM CLR 19/M11 A3007 RMK AO2 SLP117 T01891106										
8:52 PM	**64.4** °F	**15.8** °F	15%	**29.91** in	**10.0** mi	North	**8.1** mph	-	N/A		Partly Cloudy
	METAR KABQ 070252Z 36007KT 10SM FEW080 18/M09 A3009 RMK AO2 SLP129 FU FEW080 T01781094 53019										
9:52 PM	**62.1** °F	**16.0** °F	17%	**29.92** in	**10.0** mi	NNW	**10.4** mph	-	N/A		Clear
	METAR KABQ 070352Z 34009KT 10SM CLR 17/M09 A3010 RMK AO2 SLP132 T01671089										
10:52 PM	**60.1** °F	**18.0** °F	20%	**29.94** in	**10.0** mi	North	**11.5** mph	-	N/A		Clear
	METAR KABQ 070452Z 35010KT 10SM CLR 16/M08 A3012 RMK AO2 SLP136 T01561078										
11:52 PM	**57.9** °F	**17.1** °F	20%	**29.94** in	**10.0** mi	NNW	**13.8** mph	**23.0** mph	N/A		Clear
	METAR KABQ 070552Z 34012G20KT 10SM CLR 14/M08 A3012 RMK AO2 SLP136 T01441083 10222 20144 51009										

Albuquerque, NM

Albuquerque International Sunport

8:17 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

19

2017

View
Thursday, October 19, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**64** °F	**56** °F	
Max Temperature	**76** °F	**68** °F	**83** °F (1950)
Min Temperature	**51** °F	**45** °F	**19** °F (1917)
Degree Days			
Heating Degree Days	1	9	
Month to date heating degree days	72	107	
Since 1 July heating degree days	93	133	
Cooling Degree Days	0	0	

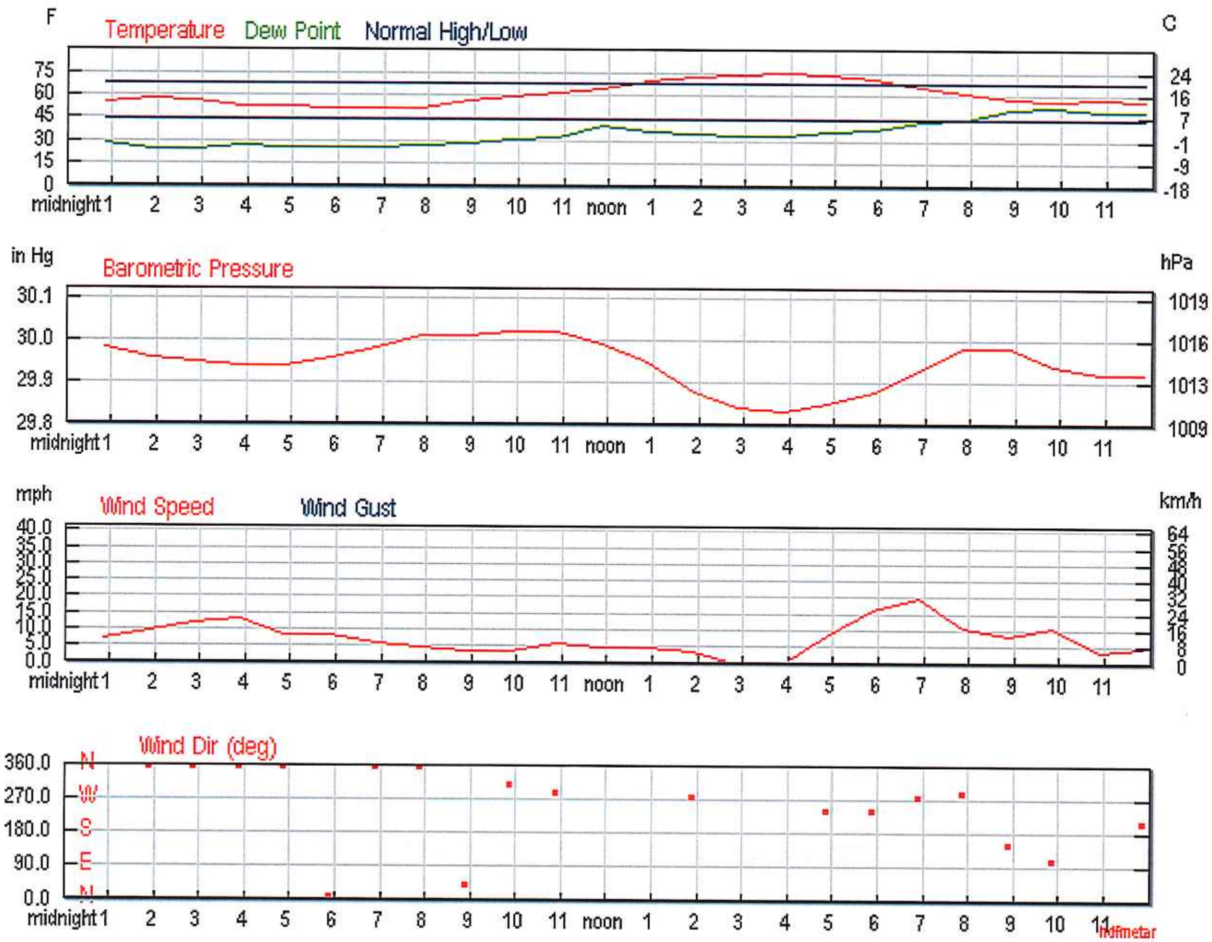
	Actual	Average	Record
Month to date cooling degree days	27	7	
Year to date cooling degree days	1557	1319	
Growing Degree Days	13 (Base 50)		
Moisture			
Dew Point	**36** °F		
Average Humidity	52		
Maximum Humidity	83		
Minimum Humidity	21		
Precipitation			
Precipitation	**T** in	**0.03** in	**0.75** in (1957)
Month to date precipitation	0.04	0.71	
Year to date precipitation	7.67	8.07	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**29.94** in		
Wind			
Wind Speed	**7** mph (NW)		
Max Wind Speed	**25** mph		

	Actual	Average	Record
Max Gust Speed	**32** mph		
Visibility	**10** miles		
Events	Rain		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

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Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

19

Submit

Astronomy

Oct. 19, 2017	**Rise**	**Set**
Actual Time	7:16 AM MDT	6:26 PM MDT
Civil Twilight	6:50 AM MDT	6:51 PM MDT
Nautical Twilight	6:20 AM MDT	7:21 PM MDT
Astronomical Twilight	5:51 AM MDT	7:50 PM MDT
Moon	7:00 AM MDT (10/19)	6:48 PM MDT (10/19)
Length of Visible Light	12h 01m	
Length of Day	11h 09m	

Waning Crescent, 0% of the Moon is Illuminated

Oct 19	Oct 19	Oct 27	Nov 3	Nov 10
Waning Crescent	New	First Quarter	Full	Last Quarter

Hourly Weather History & Observations

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**55.0** °F	**28.0** °F	35%	**29.98** in	**10.0** mi	NW	**6.9** mph	-	N/A		Scattered Clouds
	METAR KABQ 190652Z 32006KT 10SM SCT240 13/M02 A3015 RMK AO2 SLP150 T01281022 402500072										
1:52 AM	**57.0** °F	**24.1** °F	28%	**29.96** in	**10.0** mi	North	**9.2** mph	-	N/A		Mostly Cloudy
	METAR KABQ 190752Z 36008KT 10SM BKN240 14/M04 A3014 RMK AO2 SLP143 T01391044										
2:52 AM	**55.9** °F	**24.1** °F	29%	**29.95** in	**10.0** mi	North	**11.5** mph	-	N/A		Overcast
	METAR KABQ 190852Z 36010KT 10SM OVC220 13/M04 A3014 RMK AO2 SLP142 T01331044 58004										
3:52 AM	**52.0** °F	**27.0** °F	38%	**29.94** in	**10.0** mi	North	**12.7** mph	-	N/A		Mostly Cloudy
	METAR KABQ 190952Z 36011KT 10SM SCT210 BKN300 11/M03 A3013 RMK AO2 SLP138 T01111028										
4:52 AM	**52.0** °F	**26.1** °F	37%	**29.94** in	**10.0** mi	North	**8.1** mph	-	N/A		Overcast
	METAR KABQ 191052Z 36007KT 10SM BKN200 OVC300 11/M03 A3013 RMK AO2 SLP139 T01111033										
5:52 AM	**51.1** °F	**26.1** °F	38%	**29.96** in	**10.0** mi	North	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191152Z 01007KT 10SM SCT190 BKN270 11/M03 A3014 RMK AO2 SLP145 T01061033 10150 20106 55000										
6:52 AM	**51.1** °F	**26.1** °F	38%	**29.98** in	**10.0** mi	North	**5.8** mph	-	N/A		Overcast
	METAR KABQ 191252Z 36005KT 10SM FEW150 OVC190 11/M03 A3014 RMK AO2 SLP150 T01061033										
7:52 AM	**51.1** °F	**27.0** °F	39%	**30.01** in	**10.0** mi	North	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191352Z 36004KT 10SM FEW130 SCT180 BKN270 11/M03 A3015 RMK AO2 SLP162 T01061028										
8:52 AM	**55.9** °F	**28.9** °F	36%	**30.01** in	**10.0** mi	NE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191452Z 04003KT 10SM FEW130 FEW200 BKN270 13/M02 A3017 RMK AO2 SLP162 T01331017 53009										
9:52 AM	**59.0** °F	**30.9** °F	35%	**30.02** in	**10.0** mi	NW	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191552Z 31003KT 10SM FEW130 FEW190 BKN270 15/M01 A3017 RMK AO2 SLP164 T01501006										

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
10:52 AM	**62.1** °F	**33.1** °F	34%	**30.02** in	**10.0** mi	WNW	**5.8** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191652Z 29005KT 10SM FEW070 FEW190 BKN270 17/01 A3017 RMK AO2 SLP164 T01670006										
11:52 AM	**64.0** °F	**41.0** °F	43%	**29.99** in	**10.0** mi	Variable	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191752Z VRB04KT 10SM FEW060 FEW200 BKN240 18/05 A3016 RMK AO2 SLP156 T01780050 10183 20106 58003										
12:52 PM	**70.0** °F	**37.0** °F	30%	**29.95** in	**10.0** mi	Variable	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191852Z VRB04KT 10SM FEW070 FEW120 SCT200 BKN250 21/03 A3012 RMK AO2 SLP140 VIRGA W T02110028										
1:52 PM	**72.0** °F	**35.1** °F	26%	**29.88** in	**10.0** mi	West	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191952Z 28003KT 10SM FEW080 BKN140 BKN250 22/02 A3008 RMK AO2 SLP119 VIRGA S T02220017										
2:52 PM	**73.0** °F	**34.0** °F	24%	**29.84** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 192052Z 00000KT 10SM FEW090 BKN140 BKN250 23/01 A3004 RMK AO2 SLP105 T02280011 58036										
3:52 PM	**75.0** °F	**34.0** °F	22%	**29.83** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 192152Z 00000KT 10SM FEW090 SCT150 BKN250 24/01 A3002 RMK AO2 SLP100 CB DSNT E AND W T02390011										
4:52 PM	**73.0** °F	**36.0** °F	26%	**29.85** in	**10.0** mi	WSW	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 192252Z 24007KT 10SM SCT110 BKN160 BKN250 23/02 A3003 RMK AO2 SLP106 T02280022										
5:52 PM	**71.1** °F	**37.9** °F	30%	**29.88** in	**7.0** mi	WSW	**16.1** mph	-	N/A		Overcast
	METAR KABQ 192352Z 24014KT 7SM BKN100 OVC200 22/03 A3005 RMK AO2 SLP117 T02170033 10244 20178 53003										
6:52 PM	**64.9** °F	**43.0** °F	45%	**29.93** in	**7.0** mi	West	**19.6** mph	**31.1** mph	N/A		Overcast
	METAR KABQ 200052Z 28017G27KT 7SM SCT075 BKN110 OVC200 18/06 A3007 RMK AO2 PK WND 28028/0021 LTG DSNT E-S SLP133 CB DSNT SE-S T01830061										
7:52 PM	**61.0** °F	**45.0** °F	56%	**29.98** in	**10.0** mi	WNW	**10.4** mph	-	N/A		Overcast
	METAR KABQ 200152Z 29009KT 10SM OVC080 16/07 A3011 RMK AO2 PK WND 29027/0105 LTG DSNT S SLP151 CB DSNT SE-S T01610072										
8:52 PM	**57.9** °F	**51.1** °F	78%	**29.98** in	**10.0** mi	SSE	**8.1** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 200252Z 15007KT 10SM -RA SCT050 BKN080 OVC130 14/11 A3012 RMK AO2 RAB05 SLP150 MTNS OBSC NE-SE P0000 60000 T01440106 51020										
9:52 PM	**55.9** °F	**52.0** °F	87%	**29.94** in	**10.0** mi	ESE	**10.4** mph	-	**0.00** in		Overcast

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 200352Z 11009KT 10SM OVC110 13/11 A3009 RMK AO2 RAE0256 SLP138 P0000 T01330111										
10:52 PM	**57.9** °F	**50.0** °F	75%	**29.92** in	**10.0** mi	Variable	**3.5** mph	-	N/A		Overcast
	METAR KABQ 200452Z VRB03KT 10SM BKN110 OVC200 14/10 A3008 RMK AO2 SLP131 T01440100										
11:52 PM	**55.9** °F	**50.0** °F	80%	**29.92** in	**10.0** mi	SSW	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 200552Z 21004KT 10SM SCT100 BKN150 13/10 A3008 RMK AO2 SLP130 60000 T01330100 10211 20128 56011										

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Albuquerque, NM

Albuquerque International Sunport

8:18 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - December, 2017

December

7

2017

View
Thursday, December 7, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**30** °F	**37** °F	
Max Temperature	**37** °F	**47** °F	**66** °F (1981)
Min Temperature	**22** °F	**27** °F	**3** °F (1912)
Degree Days			
Heating Degree Days	35	28	
Month to date heating degree days	156	188	
Since 1 July heating degree days	725	1055	
Cooling Degree Days	0	0	

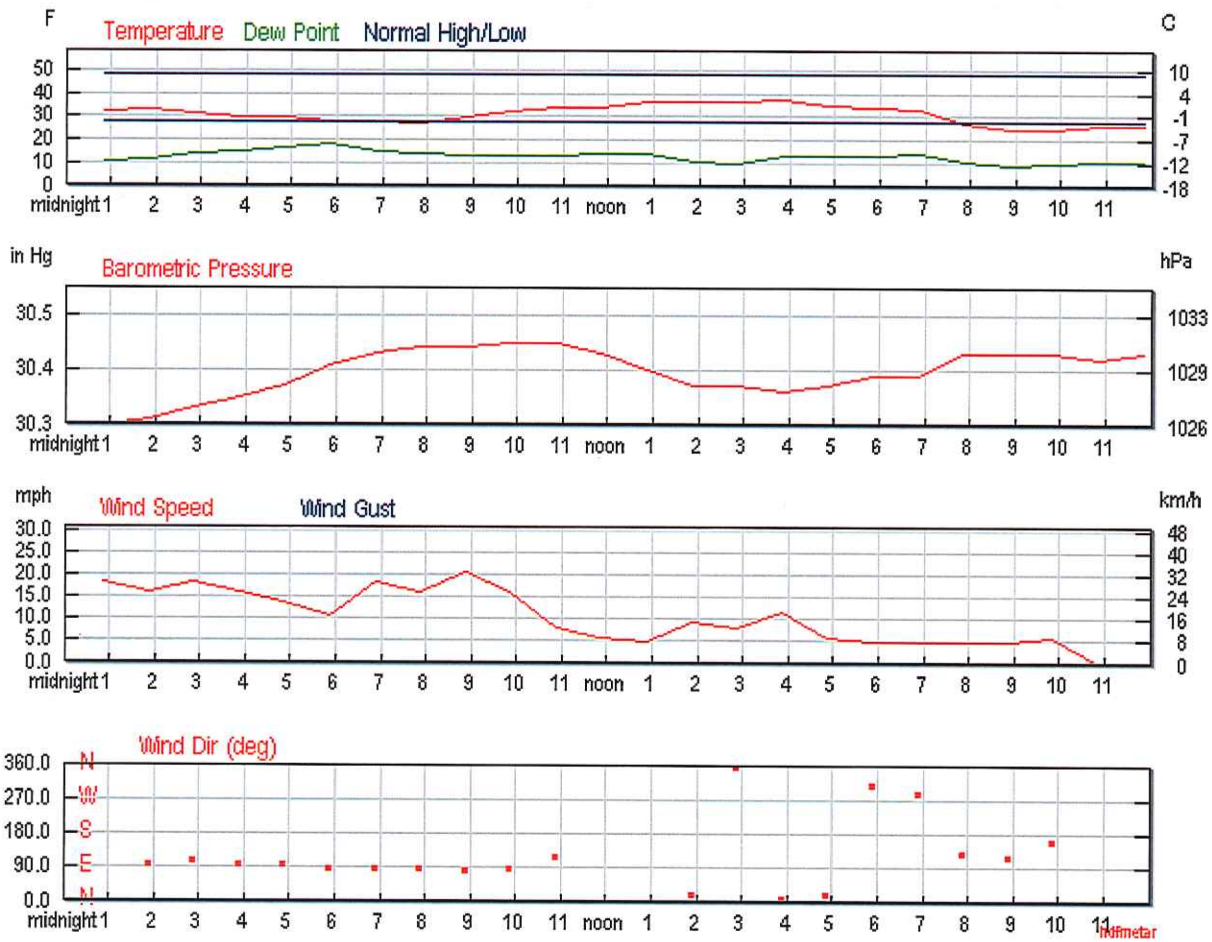
	Actual	Average	Record
Month to date cooling degree days	0	0	
Year to date cooling degree days	1557	1322	
Moisture			
Dew Point	**12** °F		
Average Humidity	50		
Maximum Humidity	68		
Minimum Humidity	32		
Precipitation			
Precipitation	**T** in	**0.01** in	**0.20** in (1998)
Month to date precipitation	T	0.12	
Year to date precipitation	7.67	9.07	
Snow			
Snow	**T** in	-	- ()
Month to date snowfall	T		
Since 1 July snowfall	T		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**30.40** in		
Wind			
Wind Speed	**10** mph (East)		
Max Wind Speed	**24** mph		
Max Gust Speed	**30** mph		
Visibility	**10** miles		

	Actual	Average	Record
Events	Snow		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

December

7

Submit

Astronomy

Dec. 07, 2017	**Rise**	**Set**
Actual Time	7:01 AM MST	4:54 PM MST
Civil Twilight	6:33 AM MST	5:22 PM MST
Nautical Twilight	6:02 AM MST	5:54 PM MST
Astronomical Twilight	5:31 AM MST	6:24 PM MST

Moon	9:40 PM MST (12/7)	10:46 AM MST (12/7)
Length of Visible Light	10h 48m	
Length of Day	9h 53m	

Waning Gibbous, 77% of the Moon is Illuminated

Dec 7	Dec 10	Dec 17	Dec 26	Jan 1
Waning Gibbous	Last Quarter	New	First Quarter	Full

Hourly Weather History & Observations

Time (MST)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**30.9** °F	**19.1** °F	**10.0** °F	42%	**30.30** in	**10.0** mi	East	**18.4** mph	-	N/A		Partly Cloudy
	METAR KABQ 070752Z 09016KT 10SM FEW020 FEW070 M01/M12 A3031 RMK AO2 SLP260 MTNS OBSC E T10061122											
1:52 AM	**32.0** °F	**21.2** °F	**10.9** °F	42%	**30.31** in	**10.0** mi	East	**16.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 070852Z 10014KT 10SM FEW020 FEW050 BKN070 00/M12 A3033 RMK AO2 SLP264 MTN TOPS OBSC NE-E T00001117 53006											
2:52 AM	**30.0** °F	**17.9** °F	**12.9** °F	49%	**30.33** in	**10.0** mi	ESE	**18.4** mph	-	N/A		Overcast
	METAR KABQ 070952Z 11016KT 10SM FEW015 SCT040 OVC060 M01/M11 A3034 RMK AO2 PK WND 09026/0908 SLP270 MTNS OBSC NE-SE T10111106 $											
3:52 AM	**28.9** °F	**17.3** °F	**14.0** °F	54%	**30.35** in	**10.0** mi	East	**16.1** mph	-	N/A		Overcast
	METAR KABQ 071052Z 10014KT 10SM FEW040 BKN060 OVC080 M02/M10 A3034 RMK AO2 SLP275 MTN TOPS OBSC NE AND SE T10171100 $											
4:52 AM	**28.9** °F	**18.2** °F	**16.0** °F	58%	**30.37** in	**10.0** mi	East	**13.8** mph	-	N/A		Overcast
	METAR KABQ 071152Z 10012KT 10SM FEW035 SCT055 BKN070 OVC140 M02/M09 A3036 RMK AO2 SLP284 MTN TOPS OBSC NE AND SE T10171089 10000 21017 53008 $											
5:52 AM	**27.0** °F	**17.3** °F	**17.1** °F	66%	**30.41** in	**10.0** mi	East	**10.4** mph	-	N/A		Scattered Clouds
	METAR KABQ 071252Z 09009KT 10SM FEW030 SCT060 SCT085 M03/M08 A3037 RMK AO2 SLP298 MTNS OBSC SE T10281083											
6:52 AM	**27.0** °F	**13.9** °F	**14.0** °F	58%	**30.43** in	**10.0** mi	East	**18.4** mph	-	N/A		Mostly Cloudy
	METAR KABQ 071352Z 09016KT 10SM FEW020 BKN060 BKN080 M03/M10 A3039 RMK AO2 SLP305 MTNS OBSC NE-SE SHSN DSNT NE-SE-S AND W T10281100											
7:52 AM	**26.1** °F	**13.6** °F	**12.9** °F	58%	**30.44** in	**10.0** mi	East	**16.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 071452Z 09014KT 10SM FEW035 SCT050 SCT080 M03/M11 A3038 RMK AO2 SLP307 MTNS OBSC NE AND SE SHSN DSNT NE AND SE AND SW T10331106 50008											
8:52 AM	**28.9** °F	**15.8** °F	**12.0** °F	49%	**30.44** in	**10.0** mi	East	**20.7** mph	-	N/A		Partly Cloudy
	METAR KABQ 071552Z 08018KT 10SM FEW040 FEW080 M02/M11 A3039 RMK AO2 SLP308 MTN TOPS OBSC NE AND SE T10171111											
9:52 AM	**30.9** °F	**19.8** °F	**12.0** °F	46%	**30.45** in	**10.0** mi	East	**16.1** mph	-	N/A		Partly Cloudy
	METAR KABQ 071652Z 09014KT 10SM FEW040 M01/M11 A3041 RMK AO2 SLP312 VCSH NE MTN TOPS OBSC NE AND SE T10061111											
10:52 AM	**33.1** °F	**26.1** °F	**12.0** °F	42%	**30.45** in	**10.0** mi	ESE	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 071752Z 12007KT 10SM BKN043 01/M11 A3040 RMK AO2 SLP309 VCSH NE AND SE MTN TOPS OBSC NE AND SE T00061111 10006 21033 50006											

Time (MST)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
11:52 AM	33.1 °F	27.7 °F	12.9 °F	43%	30.43 in	10.0 mi	Variable	5.8 mph	-	0.00 in	Snow	Light Snow
	METAR KABQ 071852Z VRB05KT 10SM -SN BKN055 01/M11 A3038 RMK AO2 SNB49 SLP302 VIRGA MTNS OBSC NE AND SE P0000 T00061106											
12:52 PM	35.1 °F	31.0 °F	12.9 °F	40%	30.40 in	10.0 mi	Variable	4.6 mph	-	0.00 in		Mostly Cloudy
	METAR KABQ 071952Z VRB04KT 10SM BKN048 02/M11 A3036 RMK AO2 SNE25 SLP292 VIRGA VCSH NE-SE MTN TOPS OBSC NE-SE P0000 T00171106											
1:52 PM	35.1 °F	27.9 °F	10.0 °F	35%	30.37 in	10.0 mi	NNE	9.2 mph	-	N/A		Mostly Cloudy
	METAR KABQ 072052Z 02008KT 10SM BKN055 BKN070 02/M12 A3034 RMK AO2 SLP284 VIRGA VCSH NE-SE MTNS OBSC NE-SE 60000 T00171122 56018											
2:52 PM	35.1 °F	28.6 °F	9.0 °F	34%	30.37 in	10.0 mi	North	8.1 mph	-	N/A		Scattered Clouds
	METAR KABQ 072152Z 36007KT 10SM FEW045 SCT060 SCT085 02/M13 A3033 RMK AO2 SLP284 VIRGA VCSH SE MTNS OBSC SE T00171128											
3:52 PM	36.0 °F	28.0 °F	12.0 °F	37%	30.36 in	10.0 mi	North	11.5 mph	-	N/A		Partly Cloudy
	METAR KABQ 072252Z 01010KT 10SM FEW050 02/M11 A3033 RMK AO2 SLP281 T00221111											
4:52 PM	34.0 °F	28.8 °F	12.0 °F	40%	30.37 in	10.0 mi	NNE	5.8 mph	-	N/A		Partly Cloudy
	METAR KABQ 072352Z 02005KT 10SM FEW050 01/M11 A3032 RMK AO2 SLP283 60000 T00111111 10028 20000 56005											
5:52 PM	33.1 °F	28.7 °F	12.0 °F	42%	30.39 in	10.0 mi	NW	4.6 mph	-	N/A		Partly Cloudy
	METAR KABQ 080052Z 31004KT 10SM FEW050 01/M11 A3033 RMK AO2 SLP289 T00061111											
6:52 PM	32.0 °F	27.5 °F	12.9 °F	45%	30.39 in	10.0 mi	WNW	4.6 mph	-	N/A		Clear
	METAR KABQ 080152Z 29004KT 10SM CLR 00/M11 A3034 RMK AO2 SLP291 T00001106											
7:52 PM	26.1 °F	20.5 °F	10.0 °F	51%	30.43 in	10.0 mi	SE	4.6 mph	-	N/A		Clear
	METAR KABQ 080252Z 13004KT 10SM CLR M03/M12 A3034 RMK AO2 SLP303 T10331122 51004											
8:52 PM	23.0 °F	17.0 °F	8.1 °F	53%	30.43 in	10.0 mi	ESE	4.6 mph	-	N/A		Partly Cloudy
	METAR KABQ 080352Z 12004KT 10SM FEW200 M05/M13 A3034 RMK AO2 SLP305 T10501133											
9:52 PM	23.0 °F	15.8 °F	9.0 °F	55%	30.43 in	10.0 mi	SSE	5.8 mph	-	N/A		Partly Cloudy
	METAR KABQ 080452Z 16005KT 10SM FEW200 M05/M13 A3035 RMK AO2 SLP304 T10501128											
10:52 PM	25.0 °F	-	10.0 °F	53%	30.42 in	10.0 mi	Calm	Calm	-	N/A		Partly Cloudy

Time (MST)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 080552Z 00000KT 10SM FEW200 M04/M12 A3035 RMK AO2 SLP301 T10391122 10011 21056 51005											
11:52 PM	**25.0** °F	-	**10.0** °F	53%	**30.43** in	**10.0** mi	Calm	Calm	-	N/A		Partly Cloudy
	METAR KABQ 080652Z 00000KT 10SM FEW200 M04/M12 A3036 RMK AO2 SLP303 T10391122 400281056											

| |

Weston Solutions, Inc.
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October 13, 2017

Ms. Kathy Verhage, P.E.
Department of Municipal Development - Storm Drainage Design
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Reference: PROJECT NO. 8010 CITYWIDE ON-CALL NPDES AND MS4 ENGINEERING SUPPORT SERVICES 3rd QUARTER 2017 UPDATE FOR TASK 3 VISUAL STORM WATER INSPECTIONS

Dear Ms. Verhage:

This Memo describes the results of the 2017 Quarter 3 Visual Storm Water Inspections for 17 City of Albuquerque (City) facilities. This evaluation and memo has been prepared to address the requirements of the U.S. Environmental Protection Agency's (EPA) Municipal Separate Storm Sewer System (MS4) Permit issued to the City in 2014 and the Multi Sector General Permit for Storm Water Discharges Associated with Industrial Activity (MSGP) at City-owned facilities. Its purpose is to document the City's compliance with the requirements relative to quarterly storm water monitoring.

To comply with the MS4 and MSGP's requirements for storm water monitoring, Weston Solutions and CDM Smith are tasked with performing quarterly visual storm monitoring at 17 City-owned facilities which meet the definition of an industrial facility in the MSGP based on audits of city owned facilities performed between 2012 and 2017. The following facilities are monitored using visual inspection methods to identify potential impacted water discharges. Locations of these facilities are also shown in Figure 1. You should note that many facilities were not inspected during the third quarter. Sites delegated to CDM Smith, our contractor, were not inspected in quarter 3. The facility list and status of monitoring are shown below.

- Arroyo Del Oso Golf Course (Visited, samples collected at all outfalls)
- Arroyo Maintenance Facility (Not monitored)
- Balloon Fiesta Park/Golf Training Center (Visited, samples collected at some outfalls)
- Albuquerque BioPark Facilities (Not monitored)
- Daytona Transit Center (Not monitored)
- Fire Department Mechanical Shop (Visited, samples collected at all outfalls)
- Fleet- 4th Street Fuel Station (Visited, samples collected at all outfalls)
- Fleet- Lomas Fuel Station (Not monitored)
- Ladera Golf Course (Not monitored)
- Los Altos Golf Course (Not monitored)
- Montessa Park Open Space (Not monitored)
- Pino Yards (Visited, samples collected, repeat samples collected)
- Puerto del Sol Golf Course (Not monitored)
- Street Satellite #1 (Not monitored)
- Street Satellite #2 (Visited, no sample- have make up samples from previous quarters)
- Street Satellite #3 (Not monitored)
- Yale Transit Center (Not monitored)

Figure 1 shows the Outfall identification names along with the inspection team responsible for monitoring the particular outfall.

Figure 1: Facility Site Locations

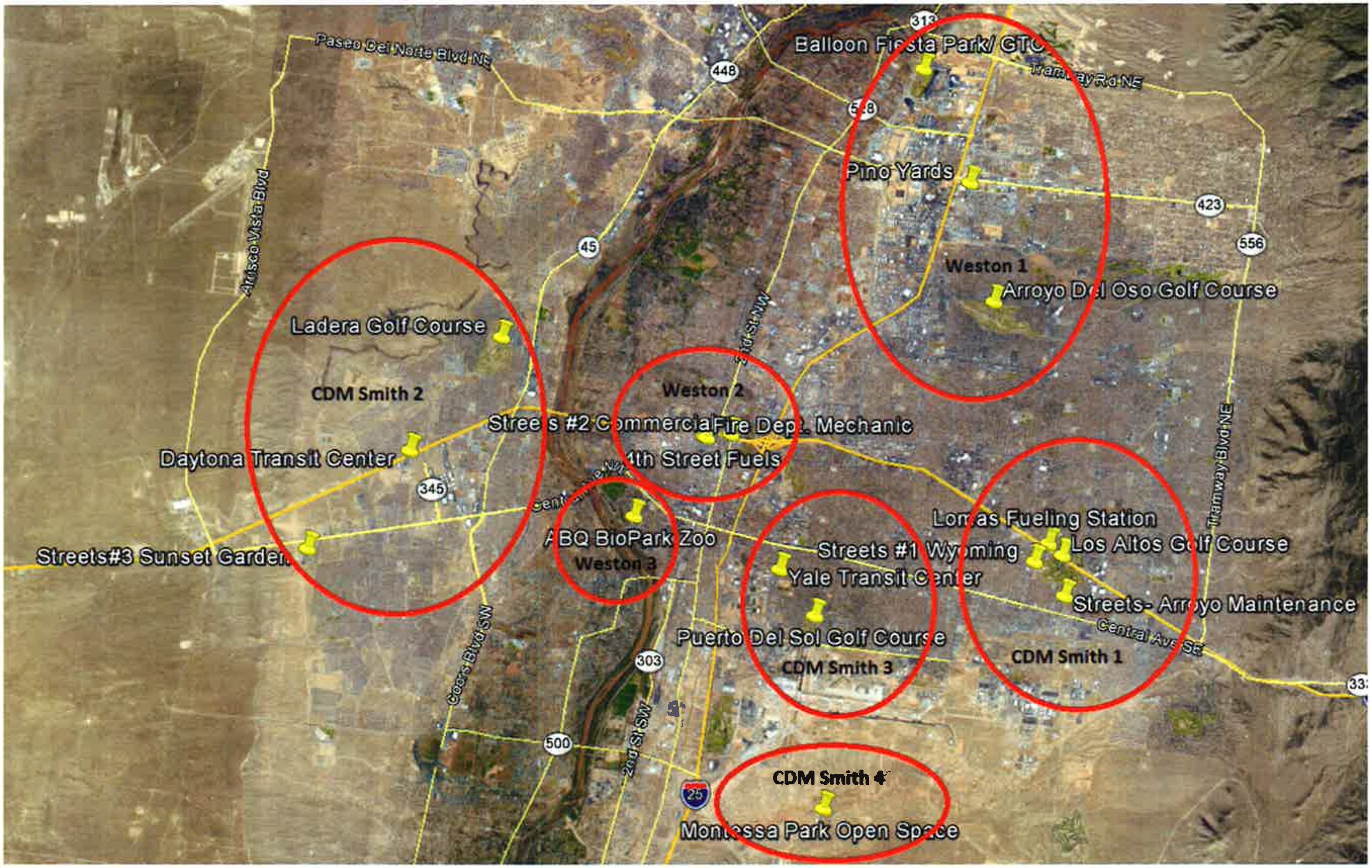

Table 1: Outfall ID and Designees

Site	Outfall ID	2017 Q3 Status
Weston 1		
Balloon Fiesta Park/ Golf Training Center	BFP1	Visited, dry – no sample
	BFP2	Visited, dry – no sample
	BFP3	Visited, sample collected
	BFP4	Visited, dry – no sample
	BFP5	Visited, dry – no sample
*Note: BFP/GTC was visited one additional time, flow was running in all outfalls but access was unavailable due to the 2017 Balloon Fiesta.		
Pino Yards	PY1	Visited, sample collected, repeat sample collected
	PY2	Visited, sample collected, repeat sample collected
	PY3	Visited, sample collected, repeat sample collected
Arroyo Del Oso Golf Course	ADO1	Visited, sample collected
	ADO2	Visited, sample collected
Weston 2		
Fleet- 4th Street Fuels	FS1	Visited, sample collected
Fire Department Mechanic Shop	FM1	Visited, sample collected
	FM2	Visited, sample collected
Street Satellite #2	SS2	Visited, no sample collected – we have one make up samples from previous quarters for this site.
CDM Smith 1		
Los Altos Golf Course	LA1	Not monitored
	LA2	Not monitored
Fleet- Lomas Fuel Station	L1	Not monitored
Arroyo Maintenance Facility	AM1	Not monitored
Street Satellite #1	SS1A	Not monitored
	SS1B	Not monitored
CDM Smith 2		
Daytona Transit Center	D1	Not monitored
	D2	Not monitored
Ladera Golf Course	LGC1	Not monitored
	LGC2	Not monitored
Street Satellite #3	SS3	Not monitored
CDM Smith 3		
Puerto Del Sol Golf Course	PDS1	Not monitored
	PDS2	Not monitored
Yale Transit Facility	Y1	Not monitored
CDM Smith 4		
Montessa Park Open Space	MP1	Not monitored
	MP2	Not monitored
Weston 3		
ABQ BioPark Facilities	BP1	Not monitored

Note: Visual monitoring for the following facilities will begin starting Q4 2017: 6th Street Parks Management, Los Altos Parks Management, Los Altos Trails/Medians Parks Management, Montessa Park Convenience Center, Don Reservoir Convenience Center, Eagle Rock Convenience Center, and Edith Yard.

Background

The MSGP establishes requirements for monitoring the quality of storm water discharges depending on the nature of activities performed at the various industrial facilities. Although benchmark monitoring is not required, the MSGP does require quarterly visual assessment of storm water quality. Visual assessment consists of the collection of grab samples from each outfall (subject to demonstration of substantially identical outfalls) and examination for the presence of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other indicators of storm water pollution.

Certain criteria regarding the precipitation event must be met for an assessment event. Visual assessment of storm water must occur:

- During daylight hours
- Within 30 minutes of start of storm water discharge (or as soon as practicable thereafter)
- At least 72 hours after the previous storm water discharge event

Weston follows the City's existing storm water monitoring protocol outlining the locations and descriptions of all outfalls to be monitored. The protocol identifies contact persons at each facility for use in notifying City personnel when members of the storm water monitoring team are mobilizing to that location. A standard visual assessment form is used by all staff to document the monitoring activities.

Quarter 3 Monitoring Results

The 3rd Quarter sampling period ran from July 1 to September 30, 2017.

- Weston Sites Group 1 mobilized 2 times during the quarter to collect samples from storm events. A visual sample was collected from 6 out of 10 outfalls over the course of the 2 mobilizations. Three repeat samples were collected at Pino Yards. Only 1 of the 5 outfalls at the Balloon Fiesta Park were monitored. Weston Team 1 mobilized on September 27 to collect samples from Balloon Fiesta, but could not gain access to the park due to set-up for the 2017 Balloon Fiesta.
- Weston Sites Group 2 mobilized 3 times and collected a sample from 3 of the 4 outfalls over the course of the 3 mobilizations. No repeat samples were collected. No sample was collected from Streets #2, however there is a sufficient backlog of repeat samples from previous quarters for this outfall.
- Weston Sites Group 3 (BioPark) did not mobilize. No samples were collected from the one outfall. No repeat samples were collected.
- CDM Smith Sites Group 1 was not visited.
- CDM Smith Sites Group 2 was not visited
- CDM Smith Sites Group 3 was not visited
- CDM Smith Sites Group 4 was not visited.

The monitoring reports and photo logs from Weston Sites Groups 1 through 3 can be found in the Appendix. Any outfalls not monitored in Quarter 3 will be made up during Quarter 4 of 2017 pending suitable weather conditions and successful contracting with CDM Smith for further efforts required.

Observed Problems

In general very few pollution problems were observed at any of the outfalls with few exceptions. Many of the grab samples exhibited presence of sediment, but no pollutants required follow up inspections or actions to occur. There were limited to no issues with oils, floatables, salts, chemicals, or other pollutant sources.

Results from the Quarter 3 Visual Inspections can be found in the Appendix. Six out of seventeen facilities were observed during the 3rd Quarter. Both visual observations and grab samples were noted at five facilities during the 3rd Quarter. Any facilities or outfalls that did not produce a sample in Quarter 3, 2017 will be made up in the coming months.

We appreciate the opportunity to provide professional consulting services to you and we look forward to assisting you in the next quarter. Please contact Sarah Luckie at (505) 837-6540 (Sarah.Luckie@WestonSolutions.com) or Brad Sumrall at (505) 837-6566 (Brad.Sumrall@WestonSolutions.com) if you have any questions or need additional information.

Sincerely,
WESTON SOLUTIONS, INC.

L. Brad Sumrall, PE
Albuquerque Operations Manager

ATTACHMENT A: Q3 INSPECTION FORMS AND PHOTO LOGS

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Albuquerque, NM 87109
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January 18, 2018

Ms. Kathy Verhage, P.E.
Department of Municipal Development - Storm Drainage Design
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Reference: PROJECT NO. 8010 CITYWIDE ON-CALL NPDES AND MS4 ENGINEERING SUPPORT SERVICES 4th QUARTER 2017 UPDATE FOR TASK 3 VISUAL STORM WATER INSPECTIONS

Dear Ms. Verhage:

This Memo describes the results of the 2017 Quarter 4 Visual Storm Water Inspections for 24 City of Albuquerque (City) facilities. This evaluation and memo has been prepared to address the requirements of the U.S. Environmental Protection Agency's (EPA) Municipal Separate Storm Sewer System (MS4) Permit issued to the City in 2014 and the Multi Sector General Permit for Storm Water Discharges Associated with Industrial Activity (MSGP) at City-owned facilities. The purpose of this memo is to document the City's compliance with the requirements relative to quarterly storm water monitoring.

To comply with the MS4 and MSGP's requirements for storm water monitoring, the City has tasked Weston Solutions and CDM Smith with performing quarterly visual stormwater monitoring at 24 City-owned facilities which meet the definition of an industrial facility in the MSGP based on audits of city owned facilities performed between 2012 and 2017. The following facilities are monitored using visual inspection methods to identify potential impacted stormwater discharges. Locations of these facilities are shown in Figure 1. Several facilities were not inspected during the fourth quarter as few qualifying storm events occurred during the quarter. The facility list and status of monitoring are shown below.

- Arroyo Del Oso Golf Course (Visited, samples collected at one outfall)
- Arroyo Maintenance Facility (Not monitored)
- Balloon Fiesta Park/Golf Training Center (Visited, samples collected at two outfalls)
- Albuquerque BioPark Facilities (Not monitored)
- Daytona Transit Center (Not monitored)
- Fire Department Mechanical Shop (Not monitored)
- Fleet- 4th Street Fuel Station (Not monitored)
- Fleet- Lomas Fuel Station (Not monitored)
- Ladera Golf Course (Not monitored)
- Los Altos Golf Course (Not monitored)
- Montessa Park Open Space (Not monitored)
- Pino Yards (Visited, no samples collected)
- Puerto del Sol Golf Course (Not monitored)
- Street Satellite #1 (Not monitored)
- Street Satellite #2 (Not monitored)
- Street Satellite #3 (Not monitored)
- Yale Transit Center (Not monitored)
- 6th Street Parks Management (Not monitored)
- Los Altos Parks Management (Not monitored)
- Los Altos Trails/Medians Parks Management (Not monitored)
- Montessa Park Convenience Center (Not monitored)

- Don Reservoir Convenience Center (Not monitored)
- Eagle Rock Convenience Center (Not monitored)
- Edith Yard (Not monitored)

Figure 1 shows the Outfall identification names along with the inspection team responsible for monitoring the particular outfall.

January 18, 2018

Figure 1: Facility Site Locations

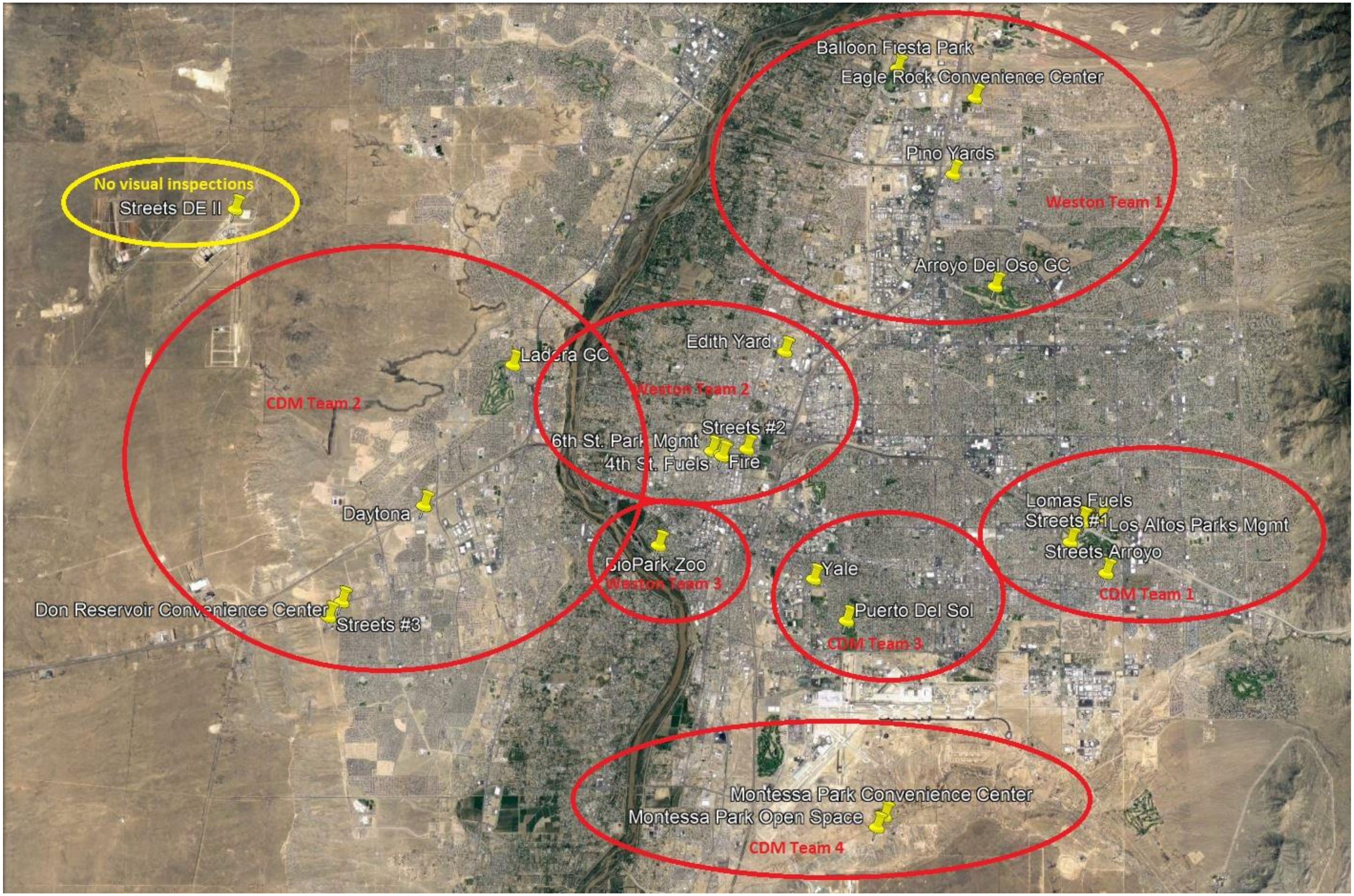


Table 1: Outfall ID and Designees

Site	Outfall ID	2017 Q4 Status
Weston 1		
Balloon Fiesta Park/ Golf Training Center	BFP1	Visited, sample collected
	BFP2	Visited, dry – no sample
	BFP3	Visited, sample collected
	BFP4	Visited, dry – no sample
	BFP5	Visited, dry – no sample
Pino Yards	PY1	Visited, dry – no sample
	PY2	Visited, dry – no sample
	PY3	Visited, dry – no sample
Arroyo Del Oso Golf Course	ADO1	Visited, dry – no sample
	ADO2	Visited, sample collected
Eagle Rock Convenience Center	ER01	Not monitored
	ER02	Not monitored
	ER03	Not monitored
Weston 2		
Fleet- 4th Street Fuels	FS1	Not monitored
Fire Department Mechanic Shop	FM1	Not monitored
	FM2	Not monitored
Street Satellite #2	SS2	Not monitored
Edith Yard	EY01	Not monitored
	EY02	Not monitored
	EY03	Not monitored
6th Street Parks Management	6PM1	Not monitored
CDM Smith 1		
Los Altos Golf Course	LA1	Not monitored
	LA2	Not monitored
Fleet- Lomas Fuel Station	L1	Not monitored
Arroyo Maintenance Facility	AM1	Not monitored
Street Satellite #1	SS1A	Not monitored
	SS1B	Not monitored
Los Altos Parks Management	LAP1	Not monitored
Los Altos Trails/Medians Parks Management	LAM1	Not monitored
CDM Smith 2		
Daytona Transit Center	D1	Not monitored
	D2	Not monitored
Ladera Golf Course	LGC1	Not monitored
	LGC2	Not monitored
Street Satellite #3	SS3	Not monitored
Don Reservoir Convenience Center	DR01	Not monitored
CDM Smith 3		
Puerto Del Sol Golf Course	PDS1	Not monitored
	PDS2	Not monitored
Yale Transit Facility	Y1	Not monitored

Site	Outfall ID	2017 Q4 Status
CDM Smith 4		
Montessa Park Open Space	MP1	Not monitored
	MP2	Not monitored
Montessa Park Convenience Center	MP01	Not monitored
	MP02	Not monitored
Weston 3		
ABQ BioPark Facilities	BP1	Not monitored

Note: The following facilities were added in Q4 2017: 6th Street Parks Management, Los Altos Parks Management, Los Altos Trails/Medians Parks Management, Montessa Park Convenience Center, Don Reservoir Convenience Center, Eagle Rock Convenience Center, and Edith Yard.

Background

The MSGP establishes requirements for monitoring the quality of storm water discharges depending on the nature of activities performed at the various industrial facilities. Although benchmark monitoring is not required, the MSGP does require quarterly visual assessment of stormwater quality. Visual assessment consists of the collection of grab samples from each outfall (subject to demonstration of substantially identical outfalls) and examination for the presence of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other indicators of storm water pollution.

Certain criteria regarding the precipitation event must be met for an assessment event. Visual assessment of storm water must occur:

- During daylight hours
- Within 30 minutes of start of storm water discharge (or as soon as practicable thereafter)
- At least 72 hours after the previous storm water discharge event

Weston follows the City's existing storm water monitoring protocol outlining the locations and descriptions of all outfalls to be monitored. The protocol identifies contact persons at each facility for use in notifying City personnel when members of the storm water monitoring team are mobilizing to that location. A standard visual assessment form is used by all staff to document the monitoring activities.

Quarter 4 Monitoring Results

The 4th Quarter sampling period ran from October 1 to December 31, 2017. Albuquerque was unusually dry during the sampling period, with only one storm occurring during the first week of October.

- Weston Sites Group 1 mobilized 2 times during the quarter to collect samples from storm events. Visual samples were collected from 3 out of 13 outfalls over the course of the 2 mobilizations. No samples were collected from Pino Yards or the Eagle Rock Convenience Center due to lack of runoff from the storm event..
- Weston Sites Group 2 did not mobilize. No samples were collected from any of the outfalls.
- Weston Sites Group 3 (BioPark) did not mobilize.
- CDM Smith Sites Group 1 was not visited.
- CDM Smith Sites Group 2 was not visited
- CDM Smith Sites Group 3 was not visited
- CDM Smith Sites Group 4 was not visited.

The monitoring reports and photo logs from Weston Sites Groups 1 through 3 can be found in the Appendix. Any outfalls not monitored in Quarter 3 will be made up during Quarter 1 of 2018 pending suitable weather conditions.

Observed Problems

In general very few pollution problems were observed at any of the outfalls with few exceptions. Many of the grab samples exhibited presence of sediment, but no pollutants required follow up inspections or actions to occur. There were limited to no issues with oils, floatables, salts, chemicals, or other pollutant sources.

Results from the Quarter 4 Visual Inspections can be found in the Appendix. Three out of 24 facilities were observed during the 4th Quarter. Both visual observations and grab samples were noted at two facilities during the 4th Quarter. As noted above, the 4th quarter experienced only one storm event that produced measurable runoff. Many sites received no rain due to the localized nature of the storm that did occur. Any facilities or outfalls that did not produce a sample in Quarter 4, 2017 will be made up in the coming months.

We appreciate the opportunity to provide professional consulting services to you and we look forward to assisting you in the next quarter. Please contact Sarah Luckie at (505) 837-6540 (Sarah.Luckie@WestonSolutions.com) or Brad Sumrall at (505) 837-6566 (Brad.Sumrall@WestonSolutions.com) if you have any questions or need additional information.

Sincerely,
WESTON SOLUTIONS, INC.

L Brad Sumrall

L. Brad Sumrall, PE
Albuquerque Operations Manager

ATTACHMENT A: Q4 INSPECTION FORMS AND PHOTO LOGS

ATTACHMENT B: NON-QUALIFYING MEMO

APPENDIX A: Q4 INSPECTION FORMS & PHOTO LOGS- VISUAL INSPECTIONS

STREETS SATELLITE #1

STREETS SATELLITE #2

STREETS SATELLITE #3

STREETS SATELLITE ARROYO MAINTENANCE

PINO YARDS

TRANSIT- YALE

TRANSIT- DAYTONA

BALLOON FIESTA PARK/ GOLF TRAINING CENTER

City of Albuquerque

Balloon Fiesta Park and Golf Training Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☐ Q2 ☐ Q3 ☒ Q4

Date:	October 5, 2017	Weather:	Cloudy / Drizzle
Time:	10:20	Storm Precip:	0.07
Inspector:	Kathryn Hayden	Last 72 Hour Precip:	Ø
Signature:	KAH	Photo:	Attached

Outfall ID:	BFP4	BFP5
Flow Observed:	☐ Yes ☒ No	☐ Yes ☒ No
Description of Monitoring Site:		
Flow Estimate (include units and method of estimation) :		
Other Observations:		
Color (Describe):		
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Suspended Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☐ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☐ No
Odor:	☐ Yes ☐ No	☐ Yes ☐ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☐ No
Describe:		

Additional Comments: Flow at the park had mostly stopped

WESTON SOLUTIONS

City of Albuquerque
Balloon Fiesta Park and Golf Training Center

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☐ Q2 ☐ Q3 ☒ Q4

Date: October 5, 2017
Time: 10:20
Inspector: Kathryn Hayden
Signature: [signature]

Weather: Cloudy/Drizzle
Storm Precip: 0.07 in
Last 72 Hour Precip: Ø
Photo: Yes

Outfall ID:	BFP1	BFP2	BFP3
Flow Observed:	☒ Yes ☐ No	☐ Yes ☒ No	☒ Yes ☐ No
Description of Monitoring Site:	Storm drains in middle of field		Outfall @ south end of park
Flow Estimate (include units and method of estimation) :	<1 cfs		<1 cfs
Other Observations:			
Color (Describe):	Tan		Brown
Turbidity:	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☐ Clear ☒ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Settled Solids:	☐ Yes ☒ No	☐ Yes ☐ No	☒ Yes ☒ No
Sheen Present:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Odor:	☐ Yes ☒ No	☐ Yes ☐ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☒ No	☐ Yes ☐ No	☒ Yes ☐ No
Describe:			

Additional Comments: Flow at the park had mostly stopped ~~from~~

WESTON SOLUTIONS

Date:	October 5, 2017
Event:	MS4 Stormwater Visual Monitoring
Inspector:	Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Balloon Fiesta Park	
 BFP1 Flow	 BFP1 Discharge
 BFP2 – No Flow	 BFP3 Flow

BFP 3 Discharge

BFP 4 – No Flow

BFP 5 – No Flow

MONTESSA PARK

LOS ALTOS GOLF COURSE

PUERTO DEL SOL GOLF COURSE

LADERA GOLF COURSE

ARROYO DEL OSO GOLF COURSE

City of Albuquerque
Arroyo Del Oso Golf Course

Quarterly Visual Monitoring of
Storm Water Outfall Discharges

☐ Q1 ☐ Q2 ☐ Q3 ☒ Q4

Date: October 4, 2017
Time: 1:35
Inspector: Kathryn Hayden
Signature: KH

Weather: Partly Cloudy
Storm Precip:
Last 72 Hour Precip: Ø
Photo: Attached

Outfall ID:	AD01	AD02
Flow Observed:	☐ Yes ☒ No	☒ Yes ☐ No
Description of Monitoring Site:		Arroyo beneath bridge
Flow Estimate (include units and method of estimation):		<1cfs
Other Observations:		~~clear~~
Color (Describe):		clear
Turbidity:	☐ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque	☒ Clear ☐ Slightly Cloudy ☐ Very Cloudy ☐ Opaque
Floating Solids:	☐ Yes ☐ No	☐ Yes ☒ No
Suspended Solids:	☐ Yes ☐ No	☒ Yes ☐ No
Settled Solids:	☐ Yes ☐ No	☒ Yes ☐ No
Sheen Present:	☐ Yes ☐ No	☐ Yes ☒ No
Odor:	☐ Yes ☐ No	☐ Yes ☒ No
Foam Present:	☐ Yes ☐ No	☐ Yes ☒ No
Describe:		

Additional Comments: Low flow present in the Arroyo at AD02 from upstream/mountain (?) rains. No recent rain at outfall location.

WESTON SOLUTIONS

Date: October 4, 2017

Event: MS4 Stormwater Visual Inspection

Inspector: Kathryn Hayden (Weston)

CITY OF ALBUQUERQUE
STORM WATER MONITORING PHOTOGRAPH LOG

Arroyo Del Oso Golf Course	
 ADO2 Sample	

FIRE DEPARTMENT MECHANIC

4^{TH} STREET FUELS

LOMAS FUELS

ABQ BIOPARK ZOO

6TH STREET PARKS MANAGEMENT

LOS ALTOS PARKS MANAGEMENT

LOS ALTOS TRAILS PARKS MANAGEMENT

MONTESSA PARK CONVENIENCE CENTER

DON RESERVIOR CONVENIENCE CENTER

EAGLE ROCK CONVENIENCE CENTER

EDITH YARD

APPENDIX B: Q4 NON- QUALIFYING MEMO

6001 Indian School Rd. NE, Suite 310
Albuquerque, NM 87110
tel: 505 243-3200
fax: 505 243-2700

January 9, 2018

Mr. Brad Sumrall, P.E.
Weston Solutions Inc.
3840 Commons Ave NE
Albuquerque, New Mexico 87109

Subject: Visual Stormwater Monitoring at the City of Albuquerque
Fourth Quarter 2017 (Task Order 19 Visual Stormwater Monitoring)
CDM Smith Project No: 76998-224341

Dear Mr. Sumrall:

CDM Smith Inc. (CDM Smith) herein notifies Weston Solutions Inc. (Weston) that a visual stormwater monitoring event was not conducted for the following City of Albuquerque facilities during the fourth quarter (Q4) of 2017:

- Arroyo Street Maintenance
- Daytona Transit Center
- Don Reservoir Convenience Center
- Ladera Golf Course
- Lomas Fuel Station
- Los Altos Golf Course
- Los Altos Park Management
- Los Altos Trails Park Management
- Montessa Park Convenience Center
- Montessa Park Open Space
- Puerto del Sol Golf Course
- Streets Satellite #1
- Streets Satellite #3
- Yale Transit Center

The National Weather Service (NWS) weather station, located approximately two to eight miles from the facilities, records precipitation event data. Precipitation events for October 2017 through December 2017 are included in **Attachment A**. Daily NWS weather reports, with data obtained from the weather station for days when precipitation was observed, are included in **Attachment B**. The events with measurable precipitation occurring during this time are summarized in **Table 1**.

Section 3.2 of 2015 Multi Sector General Permit (MSGP) describes the criteria regarding the precipitation event that must be met to qualify as an assessment event. Visual assessment of stormwater must occur:

- On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and you must document why it was not possible to take the sample within the first 30 minutes.

- For storm events on discharges that occur at least 72 hours (three days) from the previous discharge.

An additional limitation on the timing of sampling activities within the City of Albuquerque is described in the City's Storm Water Management Plan (SWMP, December 2016). Section 13.3.1.2 of the SWMP limits sampling to normal business hours – Monday through Friday, 7:30 am to 5:00 pm and not required on the following observed holidays: Thanksgiving Day and Christmas Day through New Year's Day. Therefore, storm events that occur outside of normal business hours or on a holiday are not considered qualifying events.

CDM Smith's past visual monitoring experience for City of Albuquerque facilities has shown that stormwater discharges from facilities typically do not occur for precipitation events of less than 0.1 inch of measurable rainfall. Therefore, events with less than 0.1 inch of measurable rainfall do not create a discharge and are not considered for visual assessment.

Table 1 Fourth Quarter 2017 Precipitation Events

Date	Total Precipitation (Inches)	Event Start Time	Notes
Wednesday, 10/4/2017	0.02	11:52pm	Light rain started at 11:52 pm. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.
Thursday, 10/5/2017	0.02	12:04 am	Light rain started at 12:04 am, light rain and thunderstorms continued until 1:54 am. Trace amounts of rainfall occurred throughout the day. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.

Table 1 Fourth Quarter 2017 Precipitation Events

Date	Total Precipitation (Inches)	Event Start Time	Notes
Friday, 10/6/2017	Trace Amount	5:52 am	Light rain started at 5:52 am and no other rain events occurred. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.
Thursday, 10/19/2017	Trace Amount	8:52 pm	Light rain started at 8:52 pm. Non-qualifying due to event occurring outside of normal business hours, and less than 0.1-in of rainfall.
Thursday, 12/7/2017	0.01	11:52 am	Light snow started at 11:52 am and no other snow events occurred. Non-qualifying due to less than 0.1-in of rainfall.

Notes: Events shaded in gray are non-qualifying events. Bold indicates qualifying events.

No qualifying precipitation events occurred in Q4 of 2017, as shown in **Table 1**. Rain and snow events did not accumulate greater than 0.1-inch and/or did not occur during normal business hours. Due to these circumstances, visual monitoring events were not conducted during Q4 of 2017 at any of the designated facilities.

Please contact CDM Smith at (505) 243-3200 if you have any questions or comments regarding this report.

Sincerely,

C. Tyler Irwin

Tyler Irwin, CPG, CHMM
Project Manager
CDM Smith Inc.

Trevin Heisey

Trevin Heisey
Project Engineer
CDM Smith Inc.

Attachments

cc: file

ATTACHMENT A

NWS WEATHER SUMMARY OCTOBER 1, 2017 TO DECEMBER 31, 2017

Albuquerque, NM

Albuquerque International Sunport

7:57 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

From:

October

1

2017

To:

December

31

2017

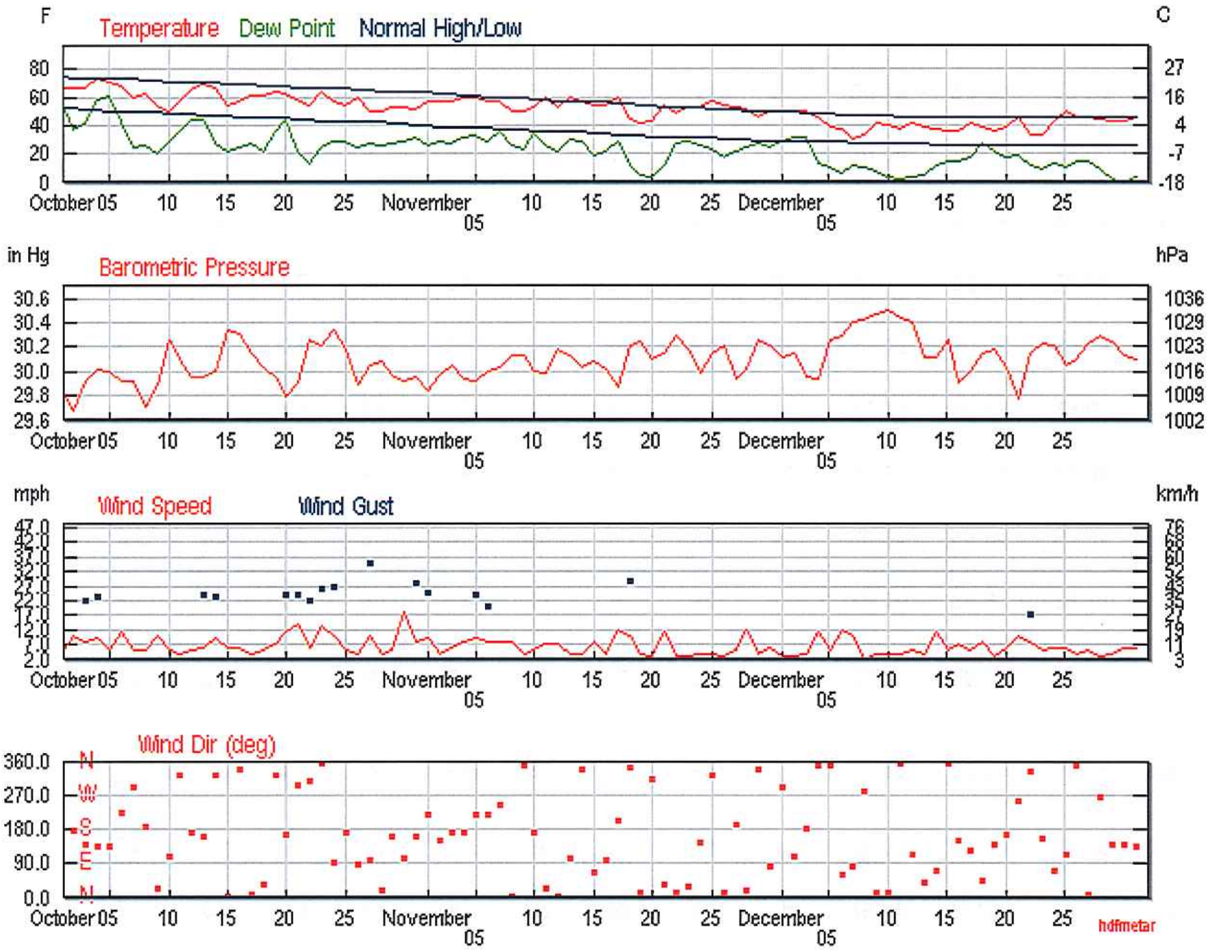
Get History

Daily | Weekly | Monthly | **Custom**

	Max	Avg	Min	Sum
Temperature				
Max Temperature	**82 °F**	**64 °F**	**37 °F**	
Mean Temperature	**73 °F**	**51 °F**	**30 °F**	
Min Temperature	**63 °F**	**38 °F**	**19 °F**	
Degree Days				

	Max	Avg	Min	Sum
Heating Degree Days (base 65)	35	14	0	1302
Cooling Degree Days (base 65)	8	0	0	27
Growing Degree Days (base 50)	24	5	0	416
Dew Point				
Dew Point	**66** °F	**23** °F	**-7** °F	
Precipitation				
Precipitation	**0.02** in	**0.00** in	**0.00** in	**0.04** in
Snowdepth	**0.0** in	**0.0** in	**0.0** in	-
Wind				
Wind	**36** mph	**7** mph	**0** mph	
Gust Wind	**47** mph	**26** mph	**16** mph	
Sea Level Pressure				
Sea Level Pressure	**30.61** in	**30.09** in	**29.56** in	

Custom Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

1

Submit

Weather History & Observations

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Oct	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
	78	67	55	60	54	42	100	69	38	30.08	29.82	29.63	10	10	9	14	5	15	0.00	
	81	67	53	44	37	27	66	40	14	29.76	29.67	29.58	10	10	10	29	10	34	0.00	
	81	66	50	55	41	28	71	45	18	30.00	29.92	29.78	10	10	10	23	8	28	0.00	
	82	73	63	61	58	55	78	59	40	30.22	30.02	29.94	10	10	10	23	9	28	0.02	Rain , Thunderstorm
	77	70	62	66	61	57	93	79	64	30.25	29.99	29.86	10	10	7	17	5	22	0.02	Rain , Thunderstorm
	80	68	56	62	43	13	100	55	10	30.10	29.91	29.77	10	10	8	28	11	42	T	Rain
	74	60	45	33	25	18	45	31	16	30.01	29.91	29.81	10	10	10	14	5	18	0.00	
	78	62	45	38	26	11	66	38	10	29.81	29.70	29.56	10	10	10	18	5	24	0.00	
	64	54	43	24	20	13	39	28	16	30.19	29.88	29.67	10	10	10	24	10	31	0.00	
	62	49	36	32	29	24	82	54	26	30.37	30.25	30.16	10	10	10	18	5	22	0.00	
	70	56	42	40	35	31	70	49	28	30.19	30.09	29.99	10	10	10	12	4	17	0.00	
	79	65	50	46	44	41	71	50	28	30.04	29.95	29.86	10	10	10	15	5	18	0.00	
	80	69	57	52	44	38	72	49	26	30.04	29.95	29.86	10	10	10	22	6	27	0.00	
	80	67	54	51	27	9	75	41	7	30.17	30.00	29.92	10	10	10	21	9	27	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	65	54	43	29	21	12	45	32	18	30.42	30.33	30.18	10	10	10	16	6	20	0.00	
	71	57	42	28	25	21	53	34	15	30.42	30.30	30.20	10	10	10	12	6	15	0.00	
	76	61	46	34	27	20	50	31	12	30.26	30.14	30.03	10	10	10	9	4	12	0.00	
	77	61	45	29	21	10	46	28	9	30.12	30.03	29.96	10	10	10	13	5	16	0.00	
	76	64	51	52	36	24	83	52	21	30.02	29.94	29.83	10	10	7	25	7	32	T	Rain
	74	62	49	51	44	31	93	60	26	29.91	29.78	29.63	10	10	10	23	11	28	0.00	
	66	58	50	36	21	-1	43	27	10	30.14	29.90	29.70	10	10	10	23	14	36	0.00	
	70	54	37	25	13	1	29	21	13	30.34	30.25	30.15	10	10	10	18	6	24	0.00	
	76	63	50	34	25	22	43	29	15	30.27	30.21	30.12	10	10	10	30	13	37	0.00	
	65	56	47	34	29	23	50	39	27	30.44	30.34	30.28	10	10	10	30	10	37	0.00	
	68	54	39	33	28	22	65	42	19	30.34	30.18	29.95	10	10	9	16	5	21	0.00	
	74	59	43	33	24	11	49	31	13	30.03	29.88	29.76	10	10	10	9	4	11	0.00	
	58	49	40	32	27	24	58	44	30	30.12	30.04	29.93	10	10	10	31	10	42	0.00	
	61	50	38	28	26	24	59	42	25	30.17	30.07	30.00	10	10	10	10	4	12	0.00	
	68	53	37	29	27	25	64	42	19	30.09	29.97	29.84	10	10	10	12	5	14	0.00	
	61	52	42	32	29	27	58	45	31	30.00	29.91	29.84	10	10	10	36	18	45	0.00	
	62	51	40	37	32	27	66	51	36	30.06	29.94	29.82	10	10	10	25	8	29	T	
2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Nov	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
	73	57	41	35	26	13	65	38	10	29.88	29.83	29.72	10	10	10	26	9	32	0.00	
	71	57	43	33	29	24	58	40	22	30.09	29.96	29.84	10	10	10	13	4	15	0.00	
	69	56	42	29	27	25	53	37	20	30.20	30.04	29.95	10	10	10	20	6	25	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	68	60	51	36	32	29	50	38	26	30.01	29.93	29.82	10	10	10	24	8	31	0.00	
	71	60	49	40	33	25	61	40	18	29.98	29.91	29.83	10	10	10	24	9	30	0.00	
	69	57	44	32	28	24	50	35	19	30.17	29.99	29.91	10	10	10	18	8	25	0.00	
	63	56	48	42	36	31	71	54	36	30.11	30.03	29.96	10	10	10	16	8	23	0.00	
	59	49	38	38	26	13	85	52	19	30.19	30.12	30.06	10	10	10	16	8	21	0.00	
	62	49	35	29	23	16	56	39	22	30.21	30.12	30.04	10	10	10	13	4	15	0.00	
	68	53	38	41	34	28	66	45	24	30.12	30.00	29.89	10	10	10	13	5	14	0.00	
	71	59	46	41	26	13	77	44	10	30.05	29.98	29.91	10	10	10	14	7	19	0.00	
	65	53	41	27	21	17	39	29	18	30.26	30.18	30.09	10	10	10	15	7	19	0.00	
	71	59	46	34	30	27	53	38	22	30.22	30.13	30.05	10	10	10	12	4	14	0.00	
	71	57	42	37	28	14	70	43	16	30.14	30.03	29.91	10	10	10	13	4	15	0.00	
	66	54	41	21	19	16	39	27	14	30.18	30.08	30.03	10	10	10	22	8	27	0.00	
	71	54	36	25	22	19	54	35	15	30.12	30.01	29.91	10	10	10	12	4	13	0.00	
	73	60	46	40	28	17	55	36	16	29.95	29.87	29.77	10	10	10	32	12	46	0.00	
	53	44	34	35	12	2	53	33	13	30.34	30.21	29.88	10	10	7	32	10	47	0.00	
	53	41	29	10	5	0	39	26	13	30.35	30.24	30.12	10	10	10	12	4	16	0.00	
	58	43	27	9	3	-4	42	26	9	30.21	30.10	30.03	10	10	10	10	3	14	0.00	
	65	54	43	28	12	0	42	28	13	30.29	30.15	30.01	10	10	10	24	11	32	0.00	
	62	48	34	28	27	24	69	48	27	30.37	30.29	30.21	10	10	10	13	3	15	0.00	
	67	53	39	32	29	26	60	43	26	30.31	30.17	30.06	10	10	10	9	3	12	0.00	
	69	52	35	30	26	23	64	42	19	30.07	29.98	29.86	10	10	10	8	4	11	0.00	
	68	56	43	25	23	20	45	32	19	30.25	30.15	30.01	10	10	10	10	4	12	0.00	
	68	54	39	23	18	14	44	29	13	30.35	30.21	30.09	10	10	10	12	3	15	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	68	53	38	24	21	16	44	31	18	30.11	29.93	29.73	10	10	10	20	5	25	0.00	
	59	51	42	30	25	18	53	41	28	30.28	30.02	29.71	10	10	10	25	12	33	0.00	
	56	45	33	28	27	25	75	53	30	30.34	30.26	30.17	10	10	10	10	4	13	0.00	
	56	49	42	27	25	22	53	40	27	30.30	30.21	30.14	10	10	10	22	6	27	0.00	
2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Dec	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
	58	50	41	32	28	25	58	47	35	30.16	30.11	30.05	10	10	10	9	3	10	0.00	
	60	49	38	34	32	29	76	57	37	30.23	30.14	30.09	10	10	10	8	3	10	0.00	
	63	50	37	33	31	29	76	53	30	30.08	29.94	29.80	10	10	10	16	4	19	0.00	
	52	45	38	33	13	-7	58	36	14	30.10	29.93	29.78	10	10	10	22	11	27	0.00	
	45	38	30	15	11	-5	47	31	15	30.33	30.25	30.10	10	10	10	21	5	28	0.00	
	48	37	25	11	6	-1	43	31	19	30.38	30.29	30.21	10	10	10	25	12	32	0.00	
	37	30	22	17	12	8	68	50	32	30.45	30.40	30.30	10	10	10	24	10	30	T	Snow
	46	33	19	12	10	7	60	43	25	30.50	30.41	30.32	10	10	10	9	2	11	0.00	
	55	41	26	12	8	4	50	32	14	30.55	30.47	30.40	10	10	10	12	4	14	0.00	
	54	40	26	7	4	1	42	27	12	30.61	30.50	30.41	10	10	10	13	4	15	0.00	
	51	37	23	4	2	-1	44	29	13	30.52	30.44	30.34	10	10	10	21	4	23	0.00	
	54	41	27	6	3	0	37	25	12	30.57	30.40	30.24	10	10	10	24	5	29	0.00	
	55	39	23	8	5	3	42	28	13	30.26	30.11	29.97	10	10	10	10	4	12	0.00	
	47	37	26	15	12	5	43	34	25	30.28	30.11	29.95	10	10	10	31	11	40	0.00	
	48	36	24	18	15	9	68	48	28	30.39	30.26	30.11	10	10	10	10	5	13	0.00	
	47	36	24	18	15	13	63	46	28	30.09	29.90	29.75	10	10	10	14	7	17	0.00	
	52	41	30	31	18	11	76	48	19	30.10	30.00	29.90	10	10	10	16	5	20	0.00	

2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
	46	38	30	31	27	21	89	67	45	30.21	30.14	30.06	10	10	10	14	8	17	0.00	
	50	36	21	31	21	11	100	61	21	30.24	30.17	30.09	10	8	0	8	3	9	0.00	Fog
	55	39	23	23	18	12	63	44	24	30.21	30.03	29.80	10	10	10	17	6	22	0.00	
	57	45	32	26	19	11	64	44	24	29.94	29.77	29.60	10	10	10	25	10	35	0.00	
	42	33	23	17	12	7	74	49	24	30.33	30.15	29.94	10	10	10	17	8	21	0.00	
	47	33	19	14	9	7	57	38	19	30.33	30.23	30.13	10	10	10	14	5	14	0.00	
	56	43	30	16	13	9	41	30	18	30.30	30.20	30.14	10	10	10	12	6	16	0.00	
	62	49	35	14	11	5	32	21	10	30.12	30.05	29.95	10	10	10	16	6	19	0.00	
	60	45	30	16	14	8	49	32	15	30.18	30.10	30.01	10	10	10	12	4	15	0.00	
	56	45	33	19	15	11	47	33	18	30.32	30.23	30.16	10	10	10	10	5	13	0.00	
	60	44	28	14	9	2	47	29	11	30.37	30.28	30.21	10	10	10	10	3	13	0.00	
	61	43	24	6	2	-1	33	21	9	30.32	30.24	30.15	10	10	10	10	4	12	0.00	
	61	43	25	6	0	-5	32	20	7	30.27	30.13	30.01	10	10	10	15	6	20	0.00	
	60	45	30	11	3	-2	39	24	9	30.23	30.10	30.01	10	10	10	14	6	17	0.00	

ATTACHMENT B

DAILY WEATHER REPORTS FOR PRECIPITATION EVENTS OCCURRING IN FOURTH QUARTER 2017

Albuquerque, NM

Albuquerque International Sunport

8:15 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

4

2017

View
Wednesday, October 4, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**73** °F	**62** °F	
Max Temperature	**82** °F	**74** °F	**87** °F (1947)
Min Temperature	**63** °F	**51** °F	**32** °F (1915)
Degree Days			
Heating Degree Days	0	4	
Month to date heating degree days	0	13	
Since 1 July heating degree days	21	39	
Cooling Degree Days	8	1	

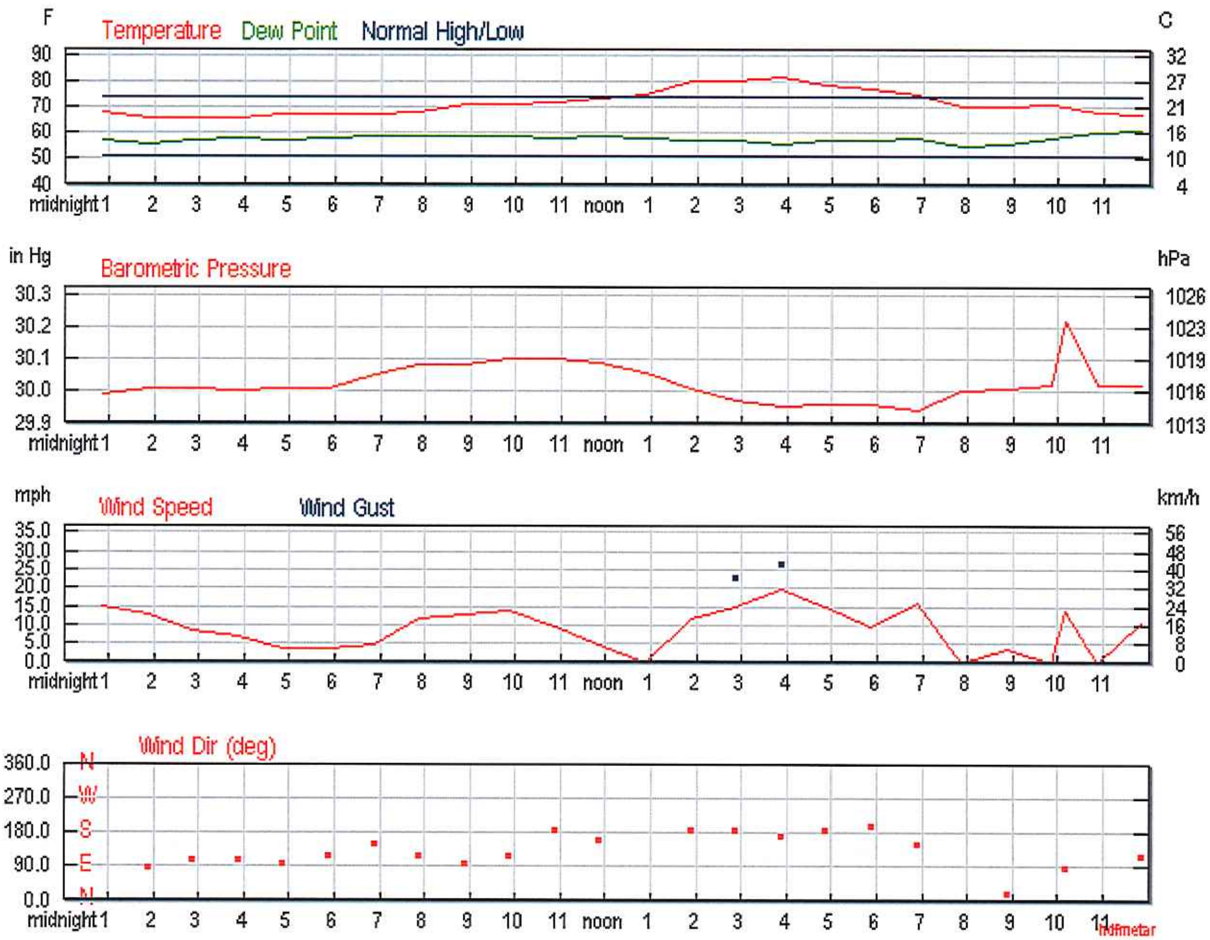
	Actual	Average	Record
Month to date cooling degree days	13	4	
Year to date cooling degree days	1543	1316	
Growing Degree Days	24 (Base 50)		
Moisture			
Dew Point	**58** °F		
Average Humidity	59		
Maximum Humidity	78		
Minimum Humidity	40		
Precipitation			
Precipitation	**0.02** in	**0.04** in	**1.75** in (1911)
Month to date precipitation	0.02	0.17	
Year to date precipitation	7.65	7.53	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**30.02** in		
Wind			
Wind Speed	**9** mph (SE)		
Max Wind Speed	**23** mph		

	Actual	Average	Record
Max Gust Speed	**28** mph		
Visibility	**10** miles		
Events	Rain , Thunderstorm		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

4

Submit

Astronomy

Oct. 04, 2017	**Rise**	**Set**
Actual Time	7:03 AM MDT	6:45 PM MDT
Civil Twilight	6:38 AM MDT	7:10 PM MDT
Nautical Twilight	6:09 AM MDT	7:40 PM MDT
Astronomical Twilight	5:39 AM MDT	8:09 PM MDT

Moon	6:31 PM MDT (10/4)	5:45 AM MDT (10/4)
Length of Visible Light	12h 32m	
Length of Day	11h 41m	

Waxing Gibbous, 99% of the Moon is Illuminated

Oct 4	Oct 5	Oct 12	Oct 19	Oct 27
Waxing Gibbous	Full	Last Quarter	New	First Quarter

Hourly Weather History & Observations

Time (MDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**68.0** °F	-	**57.0** °F	68%	**29.99** in	**10.0** mi	East	**15.0** mph	-	N/A		Partly Cloudy
	METAR KABQ 040652Z 10013KT 10SM FEW090 FEW150 20/14 A3022 RMK AO2 SLP156 T02000139 402720100											
1:52 AM	**66.0** °F	-	**55.9** °F	70%	**30.01** in	**10.0** mi	East	**12.7** mph	-	N/A		Partly Cloudy
	METAR KABQ 040752Z 09011KT 10SM FEW090 FEW150 19/13 A3023 RMK AO2 SLP163 T01890133											
2:52 AM	**66.0** °F	-	**57.0** °F	73%	**30.01** in	**10.0** mi	ESE	**8.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 040852Z 11007KT 10SM FEW045 SCT080 19/14 A3024 RMK AO2 SLP162 MTN TOPS OBSC NE T01890139 51006											
3:52 AM	**66.0** °F	-	**57.9** °F	75%	**30.00** in	**10.0** mi	ESE	**6.9** mph	-	N/A		Mostly Cloudy
	METAR KABQ 040952Z 11006KT 10SM SCT050 BKN080 19/14 A3024 RMK AO2 SLP159 MTN TOPS OBSC NE T01890144											
4:52 AM	**66.9** °F	-	**57.0** °F	70%	**30.01** in	**10.0** mi	East	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041052Z 10003KT 10SM BKN040 BKN080 19/14 A3024 RMK AO2 SLP160 MTNS OBSC NE AND SE T01940139											
5:52 AM	**66.9** °F	-	**57.9** °F	73%	**30.01** in	**10.0** mi	ESE	**3.5** mph	-	N/A		Overcast
	METAR KABQ 041152Z 12003KT 10SM FEW020 BKN030 OVC080 19/14 A3025 RMK AO2 SLP163 VIRGA W MTNS OBSC NE-SE SHRA DSNT SE T01940144 10200 20183 53005											
6:52 AM	**66.9** °F	-	**59.0** °F	76%	**30.05** in	**10.0** mi	SSE	**4.6** mph	-	N/A		Overcast
	METAR KABQ 041252Z 15004KT 10SM FEW015 BKN033 OVC070 19/15 A3027 RMK AO2 SLP174 VIRGA E CB DSNT NE-E MTNS OBSC NE-SE SHRA DSNT E T01940150											
7:52 AM	**68.0** °F	-	**59.0** °F	73%	**30.08** in	**10.0** mi	ESE	**11.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041352Z 12010KT 10SM FEW020 BKN035 BKN065 20/15 A3029 RMK AO2 SLP185 TCU DSNT NE AND SE-S MTNS OBSC NE AND SE T02000150											
8:52 AM	**71.1** °F	-	**59.0** °F	66%	**30.08** in	**10.0** mi	East	**12.7** mph	-	N/A		Mostly Cloudy
	METAR KABQ 041452Z 10011KT 10SM FEW020 BKN037 22/15 A3030 RMK AO2 SLP186 MTNS OBSC NE AND SE T02170150 51014											

Time (MDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
9:52 AM	71.1 °F	-	59.0 °F	66%	30.10 in	10.0 mi	ESE	13.8 mph	-	N/A		Mostly Cloudy
	METAR KABQ 041552Z 12012KT 10SM FEW030 BKN037 22/15 A3031 RMK AO2 SLP191 MTN TOPS OBSC NE AND SE T02170150											
10:52 AM	72.0 °F	-	57.9 °F	61%	30.10 in	10.0 mi	South	9.2 mph	-	N/A		Mostly Cloudy
	METAR KABQ 041652Z 19008KT 10SM FEW030 BKN037 BKN046 22/14 A3032 RMK AO2 SLP193 MTN TOPS OBSC NE AND SE T02220144											
11:52 AM	73.0 °F	-	59.0 °F	61%	30.09 in	10.0 mi	SSE	4.6 mph	-	N/A		Mostly Cloudy
	METAR KABQ 041752Z 16004KT 10SM BKN039 BKN050 23/15 A3031 RMK AO2 SLP187 MTN TOPS OBSC NE AND SE T02280150 10228 20194 50001											
12:52 PM	75.0 °F	-	57.9 °F	55%	30.06 in	10.0 mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 041852Z 00000KT 10SM BKN044 BKN060 24/14 A3028 RMK AO2 LTG DSNT SE SLP177 MTN TOPS OBSC NE AND SE T02390144											
1:52 PM	80.1 °F	80.4 °F	57.0 °F	45%	30.01 in	10.0 mi	South	11.5 mph	18.4 mph	N/A		Mostly Cloudy
	METAR KABQ 041952Z 19010G16KT 10SM SCT045 BKN060 BKN110 27/14 A3024 RMK AO2 LTG DSNT E SLP162 CB DSNT SE MTN TOP OBSC NE T02670139											
2:52 PM	80.1 °F	80.4 °F	57.0 °F	45%	29.97 in	10.0 mi	South	15.0 mph	23.0 mph	N/A		Mostly Cloudy
	METAR KABQ 042052Z 19013G20KT 10SM FEW045 BKN055 BKN110 BKN250 27/14 A3020 RMK AO2 SLP148 MTN TOP OBSC NE T02670139 58029											
3:52 PM	82.0 °F	81.6 °F	55.9 °F	41%	29.95 in	10.0 mi	South	19.6 mph	26.5 mph	N/A		Mostly Cloudy
	METAR KABQ 042152Z 17017G23KT 10SM BKN055 BKN090 BKN250 28/13 A3019 RMK AO2 LTG DSNT W AND NW SLP140 T02780133											
4:52 PM	79.0 °F	-	57.0 °F	47%	29.96 in	10.0 mi	South	15.0 mph	-	N/A		Mostly Cloudy
	METAR KABQ 042252Z 19013KT 10SM FEW055 BKN110 BKN250 26/14 A3019 RMK AO2 LTG DSNT NW-NE SLP143 T02610139											
5:52 PM	77.0 °F	-	57.0 °F	50%	29.96 in	10.0 mi	SSW	9.2 mph	-	N/A		Mostly Cloudy
	METAR KABQ 042352Z 20008KT 10SM FEW050 SCT090 BKN200 25/14 A3019 RMK AO2 LTG DSNT N AND NE AND SW SLP144 SHRA DSNT SW MTN TOPS OBSC NE T02500139 10278 20228 56005											
6:52 PM	75.0 °F	-	57.9 °F	55%	29.94 in	10.0 mi	SSE	16.1 mph	-	N/A		Mostly Cloudy
	METAR KABQ 050052Z 15014KT 10SM FEW050 SCT110 BKN200 24/14 A3017 RMK AO2 LTG DSNT S SLP139 VCSH SE MTNS OBSC NE-SE T02390144											
7:52 PM	70.0 °F	-	55.0 °F	59%	30.00 in	10.0 mi	Calm	Calm	-	N/A		Mostly Cloudy

Time (MDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 050152Z 00000KT 10SM FEW050 SCT110 BKN200 21/13 A3021 RMK AO2 LTG DSNT E SLP158 CB DSNT NE-E T02110128											
8:52 PM	**70.0** °F	-	**55.9** °F	61%	**30.01** in	**10.0** mi	NNE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 050252Z 02003KT 10SM FEW055 SCT090 BKN200 21/13 A3023 RMK AO2 SLP162 T02110133 53013											
9:52 PM	**71.1** °F	-	**57.9** °F	63%	**30.02** in	**10.0** mi	Calm	Calm	-	**0.00** in	Thunderstorm	Mostly Cloudy
	METAR KABQ 050352Z 00000KT 10SM VCTS FEW048 SCT085CB BKN110 BKN200 22/14 A3024 RMK AO2 LTG DSNT SE AND S RAB03E39 SLP165 TS E MOV NE MTNS OBSC NE-SE P0000 T02170144											
10:09 PM	**70.0** °F	-	**59.0** °F	68%	**30.22** in	**10.0** mi	East	**13.8** mph	-	N/A		Mostly Cloudy
	SPECI KABQ 050409Z 09012KT 10SM FEW050 SCT085 BKN110 BKN200 21/15 A3022 RMK AO2 LTG DSNT E AND S MTNS OBSC NE-SE T02110150											
10:52 PM	**68.0** °F	-	**60.1** °F	76%	**30.02** in	**10.0** mi	Calm	Calm	-	**0.00** in		Mostly Cloudy
	METAR KABQ 050452Z 00000KT 10SM FEW050 SCT085 BKN110 BKN200 20/16 A3024 RMK AO2 LTG DSNT E-SW RAB16E30 SLP166 CB DSNT SE-SW MTN TOPS OBSC NE P0000 T02000156											
11:52 PM	**66.9** °F	-	**61.0** °F	81%	**30.02** in	**10.0** mi	ESE	**10.4** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 050552Z 12009KT 10SM -RA SCT050 BKN090 OVC200 19/16 A3023 RMK AO2 LTG DSNT E-SW RAB36 SLP164 CB DSNT E-S MTNS OBSC NE P0000 60000 T01940161 10250 20189 58001											

Albuquerque, NM

Albuquerque International Sunport

8:16 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

5

2017

View
Thursday, October 5, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**70** °F	**62** °F	
Max Temperature	**77** °F	**73** °F	**91** °F (1979)
Min Temperature	**62** °F	**50** °F	**34** °F (1932)
Degree Days			
Heating Degree Days	0	4	
Month to date heating degree days	0	17	
Since 1 July heating degree days	21	43	
Cooling Degree Days	5	1	

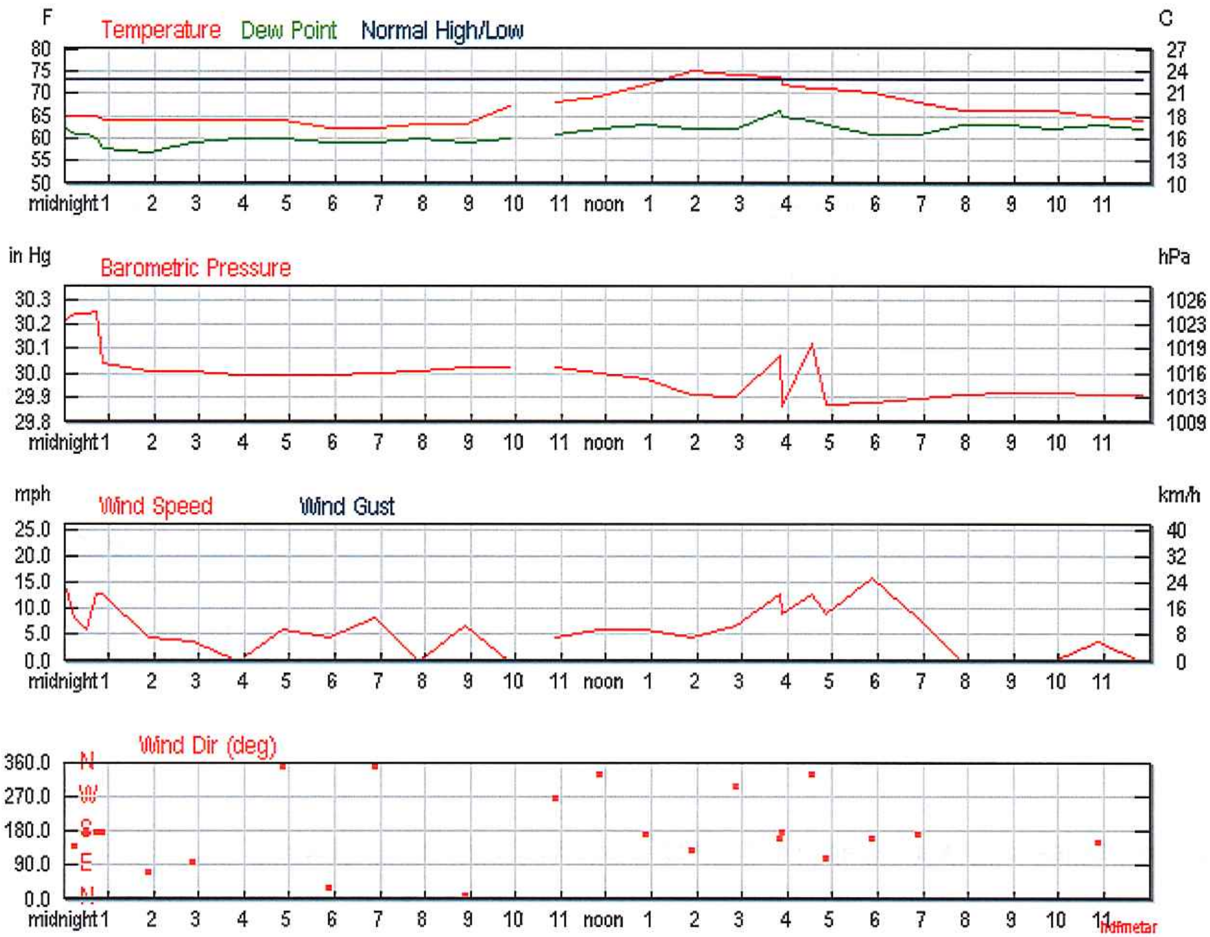
	Actual	Average	Record
Month to date cooling degree days	18	5	
Year to date cooling degree days	1548	1317	
Growing Degree Days	20 (Base 50)		
Moisture			
Dew Point	**61** °F		
Average Humidity	79		
Maximum Humidity	93		
Minimum Humidity	64		
Precipitation			
Precipitation	**0.02** in	**0.04** in	**0.80** in (1901)
Month to date precipitation	0.04	0.21	
Year to date precipitation	7.67	7.57	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**29.99** in		
Wind			
Wind Speed	**5** mph (SE)		
Max Wind Speed	**17** mph		

	Actual	Average	Record
Max Gust Speed	**22** mph		
Visibility	**10** miles		
Events	Rain , Thunderstorm		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

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Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

5

Submit

Astronomy

Oct. 05, 2017	**Rise**	**Set**
Actual Time	7:04 AM MDT	6:44 PM MDT
Civil Twilight	6:39 AM MDT	7:09 PM MDT
Nautical Twilight	6:09 AM MDT	7:38 PM MDT
Astronomical Twilight	5:40 AM MDT	8:08 PM MDT

Moon	7:07 PM MDT (10/5)	6:49 AM MDT (10/5)
Length of Visible Light	12h 30m	
Length of Day	11h 39m	

Full, 100% of the Moon is Illuminated

Oct 5	Oct 5	Oct 12	Oct 19	Oct 27
Full	Full	Last Quarter	New	First Quarter

Hourly Weather History & Observations

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:04 AM	**64.9** °F	**62.1** °F	90%	**30.22** in	**7.0** mi	ESE	**13.8** mph	-	**0.02** in	Rain , Thunderstorm	Light Rain
	SPECI KABQ 050604Z 11012KT 7SM VCTS -RA SCT050CB BKN080 OVC120 18/17 A3022 RMK AO2 LTG DSNT E-S FRQ LTGCGICCA VC S TS S MOV NE CB DSNT E MTNS OBSC NE P0002 T01830167										
12:14 AM	**64.9** °F	**61.0** °F	87%	**30.24** in	**10.0** mi	SE	**8.1** mph	-	**0.02** in	Rain , Thunderstorm	Light Thunderstorms and Rain
	SPECI KABQ 050614Z 14007KT 10SM -TSRA SCT050CB BKN080 OVC120 18/16 A3024 RMK AO2 LTG DSNT E-S TSB13 CONS LTGCGICCA SE-S TS SE-S MOV NE CB DSNT E AND SW MTNS OBSC NE P0002 T01830161										
12:30 AM	**64.9** °F	**61.0** °F	87%	**30.24** in	**10.0** mi	South	**5.8** mph	-	**0.02** in	Rain , Thunderstorm	Light Thunderstorms and Rain
	SPECI KABQ 050630Z COR 18005KT 10SM -TSRA FEW002 SCT050CB BKN080 OVC140 18/16 A3024 RMK AO2 LTG DSNT E-S TSB13 FRQ LTGCGICCA E-SE TS E-SE MOV NE CB DSNT E AND S MTNS OBSC NE VCSH E-S P0002 T01830161										
12:44 AM	**64.9** °F	**60.1** °F	84%	**30.25** in	**10.0** mi	South	**12.7** mph	-	**0.02** in		Overcast
	SPECI KABQ 050644Z 18011KT 10SM FEW004 SCT045 BKN080 OVC140 18/16 A3025 RMK AO2 LTG DSNT E-S RAE35 TSB13E44 FRQ LTGCGICCA DSNT E-S CB DSNT E-S MTNS OBSC NE SHRA E-S P0002 T01830156										
12:52 AM	**64.0** °F	**57.9** °F	80%	**30.04** in	**10.0** mi	South	**12.7** mph	-	**0.02** in		Overcast
	METAR KABQ 050652Z 18011KT 10SM FEW004 SCT045 BKN080 OVC140 18/14 A3025 RMK AO2 LTG DSNT E-S RAE35 TSB13E44 SLP170 CB DSNT E-S MTNS OBSC NE P0002 T01780144 402780178										
1:52 AM	**64.0** °F	**57.0** °F	78%	**30.01** in	**10.0** mi	ENE	**4.6** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 050752Z 07004KT 10SM -RA FEW006 FEW040 SCT080 BKN150 OVC200 18/14 A3023 RMK AO2 LTG DSNT SE RAB41 SLP161 CB DSNT NE-SE AND S MTNS OBSC NE-SE P0000 T01780139										
2:52 AM	**64.0** °F	**59.0** °F	84%	**30.01** in	**10.0** mi	East	**3.5** mph	-	**0.00** in		Mostly Cloudy

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 050852Z 10003KT 10SM FEW040 SCT100 BKN150 BKN210 18/15 A3023 RMK AO2 RAE0758 SLP160 CB DSNT NE-E MTNS OBSC NE AND SE P0000 60002 T01780150 50000										
3:52 AM	**64.0** °F	**60.1** °F	87%	**29.99** in	**10.0** mi	Calm	Calm	-	N/A		Scattered Clouds
	METAR KABQ 050952Z 00000KT 10SM FEW040 SCT110 SCT170 18/16 A3022 RMK AO2 SLP153 CB DSNT SE MTN TOPS OBSC NE AND SE T01780156										
4:52 AM	**64.0** °F	**60.1** °F	87%	**29.99** in	**10.0** mi	North	**5.8** mph	-	N/A		Scattered Clouds
	METAR KABQ 051052Z 35005KT 10SM FEW035 FEW070 SCT110 SCT160 18/16 A3021 RMK AO2 SLP153 MTN TOPS OBSC NE AND SE T01780156										
5:52 AM	**62.1** °F	**59.0** °F	90%	**29.99** in	**10.0** mi	NNE	**4.6** mph	-	N/A		Scattered Clouds
	METAR KABQ 051152Z 03004KT 10SM FEW035 SCT070 SCT100 17/15 A3020 RMK AO2 SLP154 CB DSNT W MTN TOPS OBSC NE AND SE 60002 70002 T01670150 10194 20167 56009										
6:52 AM	**62.1** °F	**59.0** °F	90%	**30.00** in	**10.0** mi	North	**8.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 051252Z 35007KT 10SM SCT040 SCT100 17/15 A3021 RMK AO2 SLP158 CB DSNT W-NW MTNS OBSC NE AND SE T01670150										
7:52 AM	**63.0** °F	**60.1** °F	90%	**30.01** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 051352Z COR 00000KT 10SM SCT028 BKN080 17/16 A3021 RMK AO2 LTG DSNT N SLP162 CB DSNT NW-N MTNS OBSC NE AND SE SHRA DSNT SE T01720156										
8:52 AM	**63.0** °F	**59.0** °F	87%	**30.02** in	**10.0** mi	North	**6.9** mph	-	N/A		Mostly Cloudy
	METAR KABQ 051452Z 01006KT 10SM SCT024 BKN090 17/15 A3022 RMK AO2 SLP165 MTN TOPS OBSC NE AND SE T01720150 53005										
9:52 AM	**66.9** °F	**60.1** °F	79%	**30.02** in	**10.0** mi	Calm	Calm	-	**0.00** in		Overcast
	METAR KABQ 051552Z 00000KT 10SM FEW044 BKN070 OVC090 19/16 A3023 RMK AO2 LTG DSNT N AND NW RAB25E38 SLP164 VCSH NE MTN TOPS OBSC NE AND SE P0000 T01940156										
10:18 AM	-	-	N/A%	-	-	North	-	-	N/A		Unknown
	METAR KABQ 051618 MTRCQC										

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
10:52 AM	**68.0** °F	**61.0** °F	78%	**30.02** in	**10.0** mi	West	**4.6** mph	-	**0.00** in	Rain	Light Rain
	METAR KABQ 051652Z 27004KT 10SM -RA FEW020 BKN060 BKN090 20/16 A3022 RMK AO2 RAB1555E01B49 SLP165 MTN TOPS OBSC NE AND SE P0000 T02000161										
11:52 AM	**69.1** °F	**62.1** °F	78%	**30.00** in	**10.0** mi	NNW	**5.8** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 051752Z 33005KT 10SM FEW022 BKN031 BKN060 21/17 A3020 RMK AO2 RAE20 SLP158 MTN TOPS OBSC NE AND SE P0000 60000 T02060167 10206 20167 58005										
12:52 PM	**72.0** °F	**63.0** °F	73%	**29.97** in	**10.0** mi	South	**5.8** mph	-	N/A		Mostly Cloudy
	METAR KABQ 051852Z 17005KT 10SM FEW025TCU BKN060 BKN240 22/17 A3018 RMK AO2 SLP149 TCU NE-E MTN TOPS OBSC NE AND SE T02220172										
1:52 PM	**75.0** °F	**62.1** °F	64%	**29.91** in	**10.0** mi	SE	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 051952Z 13004KT 10SM SCT040 SCT110 SCT150 BKN250 24/17 A3013 RMK AO2 SLP127 MTN TOPS OBSC NE AND SE T02390167										
2:52 PM	**73.9** °F	**62.1** °F	66%	**29.90** in	**10.0** mi	WNW	**6.9** mph	-	N/A		Mostly Cloudy
	METAR KABQ 052052Z 30006KT 10SM SCT030 SCT100 BKN220 23/17 A3011 RMK AO2 LTG DSNT SW SLP125 CB DSNT W-NW TCU DSNT SE SHRA DSNT SW-NW MTN TOPS OBSC NE AND SE T02330167 56026										
3:50 PM	**73.4** °F	**66.2** °F	78%	**30.07** in	**7.0** mi	SSE	**12.7** mph	-	**0.02** in	Rain , Thunderstorm	Light Rain
	SPECI KABQ 052150Z 16011KT 7SM VCTS -RA FEW050 BKN080CB BKN100 23/19 A3007 RMK AO2 LTG DSNT ALQDS RAB09 TSE44 OCNL LTGCG VC S TS S MOV E MTN TOPS OBSC NE P0002										
3:52 PM	**72.0** °F	**64.9** °F	78%	**29.86** in	**7.0** mi	South	**9.2** mph	-	**0.02** in	Rain , Thunderstorm	Light Rain
	METAR KABQ 052152Z 18008KT 7SM VCTS -RA FEW050 BKN080CB BKN100 22/18 A3007 RMK AO2 LTG DSNT ALQDS RAB09 TSE44 SLP112 OCNL LTGCG VC S TS S MOV E MTN TOPS OBSC NE P0002 T02220183										
4:33 PM	**71.1** °F	**64.0** °F	78%	**30.12** in	**10.0** mi	NNW	**12.7** mph	-	**0.00** in		Mostly Cloudy
	SPECI KABQ 052233Z 33011KT 10SM SCT025 BKN045 BKN110 BKN200 22/18 A3012 RMK AO2 LTG DSNT ALQDS RAE33 MTNS OBSC NE-SE P0000 T02170178										
4:52 PM	**71.1** °F	**63.0** °F	75%	**29.87** in	**10.0** mi	ESE	**9.2** mph	-	**0.00** in	Rain	Light Rain

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 052252Z 11008KT 10SM -RA FEW027 BKN070 BKN110 BKN200 22/17 A3008 RMK AO2 LTG DSNT ALQDS RAE33B38 SLP115 CB DSNT SW MTNS OBSC NE-SE P0000 T02170172										
5:52 PM	**70.0** °F	**61.0** °F	73%	**29.88** in	**10.0** mi	SSE	**16.1** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 052352Z 16014KT 10SM FEW030 SCT070 BKN140 BKN200 21/16 A3008 RMK AO2 LTG DSNT S AND SW RAE00 SLP119 CB DSNT SE SHRA DSNT E-SE MTNS OBSC SE P0000 60002 T02110161 10250 20206 50003										
6:52 PM	**68.0** °F	**61.0** °F	78%	**29.89** in	**10.0** mi	South	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 060052Z 17007KT 10SM SCT060 BKN120 BKN200 20/16 A3008 RMK AO2 LTG DSNT SE AND S SLP120 CB DSNT SE-SW SHRA DSNT SE-SW MTNS OBSC SE T02000161										
7:52 PM	**66.0** °F	**63.0** °F	90%	**29.91** in	**10.0** mi	Calm	Calm	-	**0.00** in	Rain	Light Rain
	METAR KABQ 060152Z 00000KT 10SM -RA SCT065 BKN110 BKN200 19/17 A3009 RMK AO2 LTG DSNT S-W RAB42 SLP126 MTNS OBSC NE-SE P0000 T01890172										
8:52 PM	**66.0** °F	**63.0** °F	90%	**29.92** in	**10.0** mi	Calm	Calm	-	**0.00** in		Mostly Cloudy
	METAR KABQ 060252Z 00000KT 10SM FEW070 BKN110 BKN200 19/17 A3011 RMK AO2 LTG DSNT SE AND S RAE18 SLP132 P0000 60000 T01890172 53009										
9:52 PM	**66.0** °F	**62.1** °F	87%	**29.92** in	**10.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 060352Z 00000KT 10SM FEW070 BKN095 BKN200 19/17 A3012 RMK AO2 SLP132 T01890167										
10:52 PM	**64.9** °F	**63.0** °F	93%	**29.91** in	**10.0** mi	SSE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 060452Z 15003KT 10SM FEW070 SCT100 BKN200 18/17 A3011 RMK AO2 SLP128 T01830172										
11:52 PM	**64.0** °F	**62.1** °F	93%	**29.91** in	**10.0** mi	Calm	Calm	-	N/A		Scattered Clouds
	METAR KABQ 060552Z 00000KT 10SM FEW070 SCT110 SCT200 18/17 A3011 RMK AO2 SLP128 60000 T01780167 10206 20178 51000										

Albuquerque, NM

Albuquerque International Sunport

8:17 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

6

2017

View
Friday, October 6, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**68** °F	**61** °F	
Max Temperature	**80** °F	**73** °F	**87** °F (1956)
Min Temperature	**56** °F	**50** °F	**29** °F (1915)
Degree Days			
Heating Degree Days	0	4	
Month to date heating degree days	0	21	
Since 1 July heating degree days	21	47	
Cooling Degree Days	3	1	

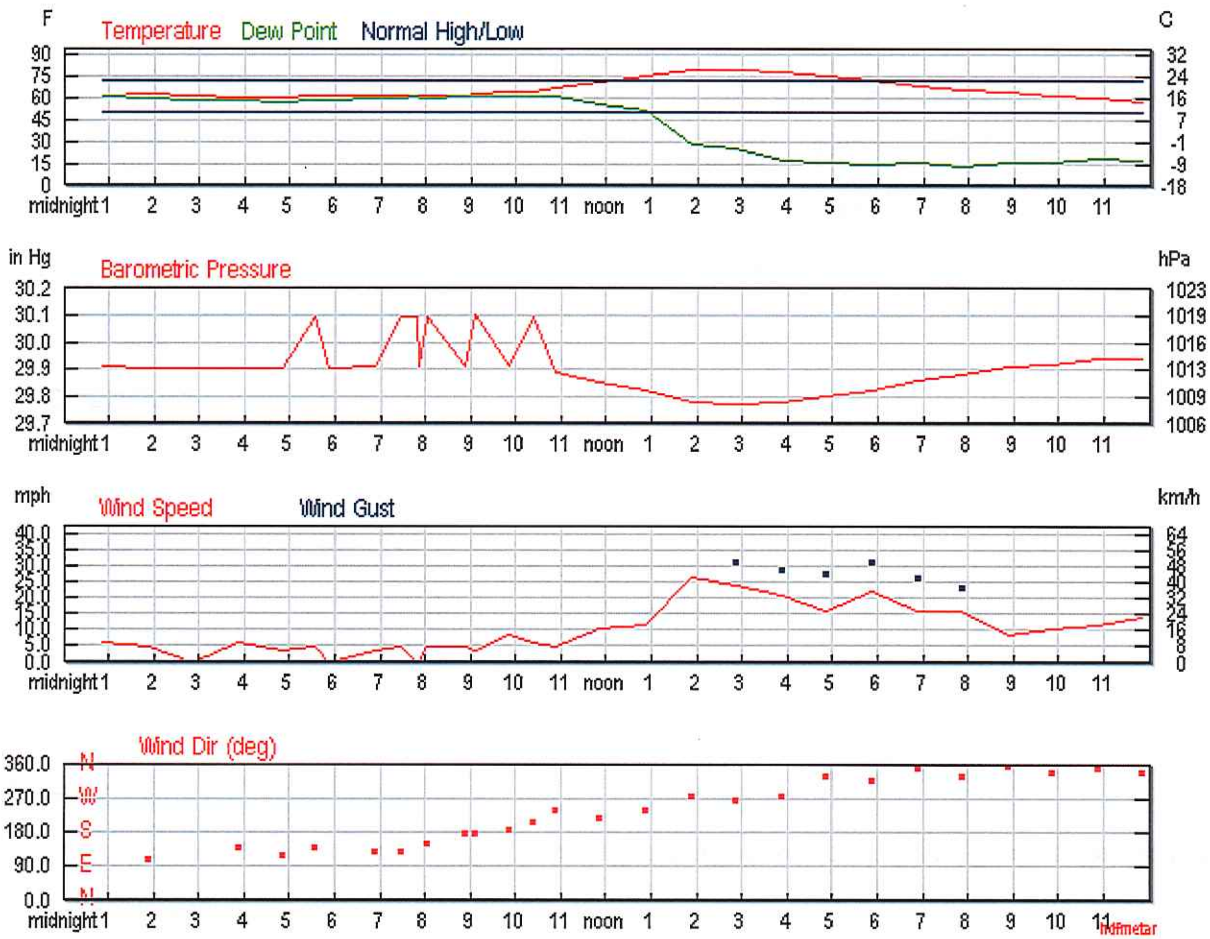
	Actual	Average	Record
Month to date cooling degree days	21	6	
Year to date cooling degree days	1551	1318	
Growing Degree Days	19 (Base 50)		
Moisture			
Dew Point	**43** °F		
Average Humidity	55		
Maximum Humidity	100		
Minimum Humidity	10		
Precipitation			
Precipitation	**T** in	**0.04** in	**1.15** in (1901)
Month to date precipitation	0.04	0.25	
Year to date precipitation	7.67	7.61	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**29.91** in		
Wind			
Wind Speed	**11** mph (SW)		
Max Wind Speed	**28** mph		

	Actual	Average	Record
Max Gust Speed	**42** mph		
Visibility	**10** miles		
Events	Rain		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

6

Submit

Astronomy

Oct. 06, 2017	**Rise**	**Set**
Actual Time	7:05 AM MDT	6:42 PM MDT
Civil Twilight	6:40 AM MDT	7:08 PM MDT
Nautical Twilight	6:10 AM MDT	7:37 PM MDT
Astronomical Twilight	5:41 AM MDT	8:06 PM MDT
Moon	7:45 PM MDT (10/6)	7:54 AM MDT (10/6)
Length of Visible Light	12h 28m	
Length of Day	11h 37m	

Full, 99% of the Moon is Illuminated

Oct 6	Oct 12	Oct 19	Oct 27	Nov 3
Full	Last Quarter	New	First Quarter	Full

Hourly Weather History & Observations

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**62.1** °F	**62.1** °F	100%	**29.91** in	**10.0** mi	ESE	**5.8** mph	-	N/A		Scattered Clouds
	METAR KABQ 060652Z 12005KT 10SM FEW040 FEW070 SCT110 SCT200 17/17 A3011 RMK AO2 SLP129 CB DSNT SE MTN TOPS OBSC NE AND SE T01670167 402500167										
1:52 AM	**63.0** °F	**60.1** °F	90%	**29.90** in	**10.0** mi	ESE	**4.6** mph	-	N/A		Scattered Clouds
	METAR KABQ 060752Z 11004KT 10SM FEW040 FEW090 SCT110 17/16 A3011 RMK AO2 SLP125 CONS LTGCGCC DSNT E-SE AND S CB DSNT E-SE AND S MTN TOPS OBSC NE AND SE T01720156										
2:52 AM	**61.0** °F	**59.0** °F	93%	**29.90** in	**10.0** mi	Calm	Calm	-	N/A		Scattered Clouds
	METAR KABQ 060852Z 00000KT 10SM FEW040 FEW080 SCT110 16/15 A3010 RMK AO2 SLP123 MTN TOPS OBSC NE T01610150 58003										
3:52 AM	**60.1** °F	**59.0** °F	96%	**29.90** in	**10.0** mi	SE	**5.8** mph	-	N/A		Scattered Clouds
	METAR KABQ 060952Z 14005KT 10SM FEW040 FEW075 SCT100 16/15 A3010 RMK AO2 SLP125 MTN TOPS OBSC NE AND SE T01560150										
4:52 AM	**60.1** °F	**57.9** °F	93%	**29.90** in	**10.0** mi	ESE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 061052Z 12003KT 10SM FEW030 FEW060 SCT079 BKN130 16/14 A3009 RMK AO2 SLP123 MTN TOPS OBSC NE T01560144										
5:34 AM	**61.0** °F	**59.0** °F	93%	**30.09** in	**10.0** mi	SE	**4.6** mph	-	N/A		Mostly Cloudy
	SPECI KABQ 061134Z 14004KT 10SM FEW001 FEW020 BKN080 BKN130 16/15 A3009 RMK AO2 MTNS OBSC NE-SE T01610150										
5:52 AM	**61.0** °F	**59.0** °F	93%	**29.90** in	**10.0** mi	Calm	Calm	-	**0.00** in	Rain	Light Rain
	METAR KABQ 061152Z 00000KT 10SM -RA FEW001 FEW020 SCT080 BKN130 16/15 A3009 RMK AO2 RAB35 SLP123 MTNS OBSC NE-SE P0000 60000 70002 T01610150 10178 20156 56004										
6:52 AM	**62.1** °F	**60.1** °F	93%	**29.91** in	**10.0** mi	SE	**3.5** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 061252Z 13003KT 10SM FEW013 SCT030 BKN080 BKN130 17/16 A3009 RMK AO2 RAE1159 SLP126 MTNS OBSC NE-SE P0000 T01670156										
7:27 AM	**62.1** °F	**60.1** °F	93%	**30.09** in	**10.0** mi	SE	**4.6** mph	-	N/A		Overcast
	SPECI KABQ 061327Z 13004KT 10SM SCT009 SCT030 BKN080 OVC130 17/16 A3009 RMK AO2 MTNS OBSC NE-SE T01670156										

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
7:50 AM	**60.8** °F	**60.8** °F	100%	**30.09** in	**8.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	SPECI KABQ 061350Z 00000KT 8SM SCT007 BKN080 16/16 A3009 RMK AO2 MTNS OBSC NE-SE										
7:52 AM	**61.0** °F	**60.1** °F	97%	**29.91** in	**8.0** mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 061352Z 00000KT 8SM SCT007 BKN080 16/16 A3009 RMK AO2 SLP128 MTNS OBSC NE-SE T01610156										
8:01 AM	**61.0** °F	**60.1** °F	97%	**30.09** in	**10.0** mi	SSE	**4.6** mph	-	N/A		Mostly Cloudy
	SPECI KABQ 061401Z 15004KT 10SM BKN007 BKN080 16/16 A3009 RMK AO2 MTNS OBSC NE-SE T01610156										
8:52 AM	**62.1** °F	**62.1** °F	100%	**29.91** in	**10.0** mi	South	**4.6** mph	-	N/A		Overcast
	METAR KABQ 061452Z 18004KT 10SM BKN007 OVC085 17/17 A3010 RMK AO2 SLP128 MTNS OBSC NE-SE 60000 T01670167 51002										
9:06 AM	**63.0** °F	**62.1** °F	97%	**30.10** in	**10.0** mi	South	**3.5** mph	-	N/A		Overcast
	SPECI KABQ 061506Z 18003KT 10SM OVC005 17/17 A3010 RMK AO2 MTNS OBSC NE-SE T01720167										
9:52 AM	**64.0** °F	**62.1** °F	93%	**29.91** in	**10.0** mi	South	**8.1** mph	-	N/A		Overcast
	METAR KABQ 061552Z 19007KT 10SM OVC006 18/17 A3010 RMK AO2 SLP127 MTNS OBSC NE-SE T01780167										
10:24 AM	**64.9** °F	**62.1** °F	90%	**30.09** in	**10.0** mi	SSW	**5.8** mph	-	N/A		Partly Cloudy
	SPECI KABQ 061624Z 21005KT 10SM FEW006 FEW090 18/17 A3009 RMK AO2 T01830167										
10:52 AM	**66.9** °F	**61.0** °F	81%	**29.89** in	**10.0** mi	WSW	**4.6** mph	-	N/A		Partly Cloudy
	METAR KABQ 061652Z 24004KT 10SM FEW030 19/16 A3009 RMK AO2 SLP122 MTN TOPS OBSC NE-SE T01940161										
11:52 AM	**71.1** °F	**55.9** °F	59%	**29.85** in	**10.0** mi	SW	**10.4** mph	-	N/A		Partly Cloudy
	METAR KABQ 061752Z COR 22009KT 10SM FEW040 FEW060 22/13 A3006 RMK AO2 SLP108 MTN TOPS OBSC SE 60000 T02170133 10217 20161 58010										
12:52 PM	**75.9** °F	**52.0** °F	43%	**29.82** in	**10.0** mi	WSW	**11.5** mph	-	N/A		Scattered Clouds
	METAR KABQ 061852Z 24010KT 10SM SCT055 24/11 A3003 RMK AO2 SLP097 T02440111										
1:52 PM	**79.0** °F	**28.0** °F	15%	**29.78** in	**10.0** mi	West	**26.5** mph	**32.2** mph	N/A		Partly Cloudy
	METAR KABQ 061952Z 28023G28KT 10SM FEW090 26/M02 A3001 RMK AO2 PK WND 30037/1917 SLP084 T02611022										
2:52 PM	**79.0** °F	**25.0** °F	14%	**29.77** in	**10.0** mi	West	**24.2** mph	**31.1** mph	N/A		Partly Cloudy

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 062052Z 27021G27KT 10SM FEW100 26/M04 A2999 RMK AO2 PK WND 26029/2039 SLP079 CB DSNT SE T02611039 56021										
3:52 PM	**78.1** °F	**17.1** °F	10%	**29.78** in	**10.0** mi	West	**20.7** mph	**28.8** mph	N/A		Partly Cloudy
	METAR KABQ 062152Z 28018G25KT 10SM FEW120 26/M08 A2999 RMK AO2 PK WND 25029/2101 SLP082 CB DSNT SE T02561083										
4:52 PM	**75.9** °F	**16.0** °F	10%	**29.80** in	**10.0** mi	NNW	**16.1** mph	**27.6** mph	N/A		Partly Cloudy
	METAR KABQ 062252Z 33014G24KT 10SM FEW070 24/M09 A3001 RMK AO2 PK WND 31028/2239 SLP089 T02441089										
5:52 PM	**72.0** °F	**14.0** °F	11%	**29.82** in	**10.0** mi	NW	**21.9** mph	**31.1** mph	N/A		Partly Cloudy
	METAR KABQ 062352Z 32019G27KT 10SM FEW070 22/M10 A3003 RMK AO2 PK WND 34029/2336 SLP098 T02221100 10267 20217 53012										
6:52 PM	**68.0** °F	**15.8** °F	13%	**29.86** in	**10.0** mi	North	**16.1** mph	**26.5** mph	N/A		Partly Cloudy
	METAR KABQ 070052Z 35014G23KT 10SM FEW080 20/M09 A3005 RMK AO2 PK WND 30028/0014 SLP109 FU FEW080 T02001094										
7:52 PM	**66.0** °F	**12.9** °F	13%	**29.88** in	**10.0** mi	NNW	**16.1** mph	**23.0** mph	N/A		Clear
	METAR KABQ 070152Z 33014G20KT 10SM CLR 19/M11 A3007 RMK AO2 SLP117 T01891106										
8:52 PM	**64.4** °F	**15.8** °F	15%	**29.91** in	**10.0** mi	North	**8.1** mph	-	N/A		Partly Cloudy
	METAR KABQ 070252Z 36007KT 10SM FEW080 18/M09 A3009 RMK AO2 SLP129 FU FEW080 T01781094 53019										
9:52 PM	**62.1** °F	**16.0** °F	17%	**29.92** in	**10.0** mi	NNW	**10.4** mph	-	N/A		Clear
	METAR KABQ 070352Z 34009KT 10SM CLR 17/M09 A3010 RMK AO2 SLP132 T01671089										
10:52 PM	**60.1** °F	**18.0** °F	20%	**29.94** in	**10.0** mi	North	**11.5** mph	-	N/A		Clear
	METAR KABQ 070452Z 35010KT 10SM CLR 16/M08 A3012 RMK AO2 SLP136 T01561078										
11:52 PM	**57.9** °F	**17.1** °F	20%	**29.94** in	**10.0** mi	NNW	**13.8** mph	**23.0** mph	N/A		Clear
	METAR KABQ 070552Z 34012G20KT 10SM CLR 14/M08 A3012 RMK AO2 SLP136 T01441083 10222 20144 51009										

Albuquerque, NM

Albuquerque International Sunport

8:17 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - October, 2017

October

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2017

View
Thursday, October 19, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**64** °F	**56** °F	
Max Temperature	**76** °F	**68** °F	**83** °F (1950)
Min Temperature	**51** °F	**45** °F	**19** °F (1917)
Degree Days			
Heating Degree Days	1	9	
Month to date heating degree days	72	107	
Since 1 July heating degree days	93	133	
Cooling Degree Days	0	0	

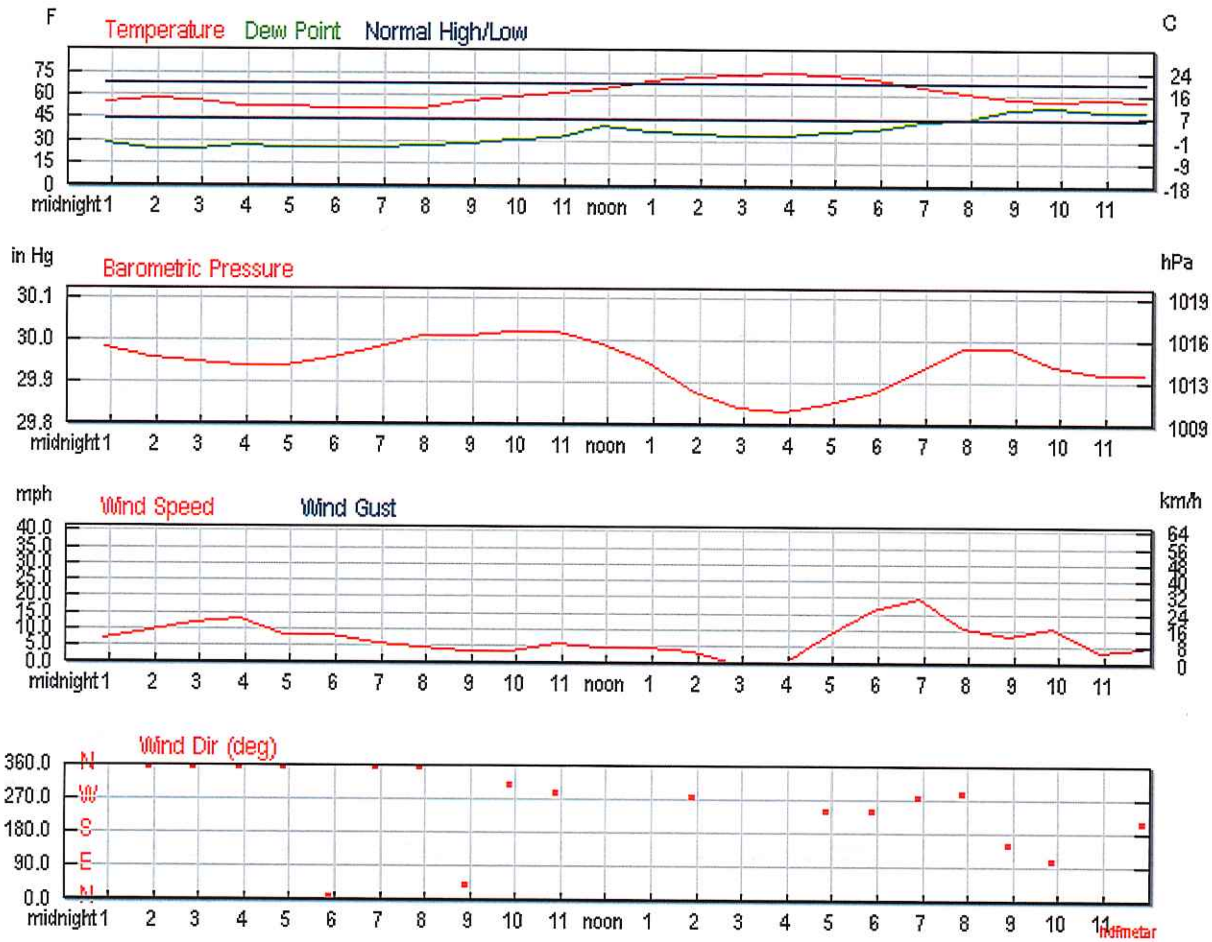
	Actual	Average	Record
Month to date cooling degree days	27	7	
Year to date cooling degree days	1557	1319	
Growing Degree Days	13 (Base 50)		
Moisture			
Dew Point	**36** °F		
Average Humidity	52		
Maximum Humidity	83		
Minimum Humidity	21		
Precipitation			
Precipitation	**T** in	**0.03** in	**0.75** in (1957)
Month to date precipitation	0.04	0.71	
Year to date precipitation	7.67	8.07	
Snow			
Snow	**0.00** in	-	- ()
Month to date snowfall	0.0		
Since 1 July snowfall	0.0		
Since 1 September snowfall	0.0		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**29.94** in		
Wind			
Wind Speed	**7** mph (NW)		
Max Wind Speed	**25** mph		

	Actual	Average	Record
Max Gust Speed	**32** mph		
Visibility	**10** miles		
Events	Rain		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

October

19

Submit

Astronomy

Oct. 19, 2017	**Rise**	**Set**
Actual Time	7:16 AM MDT	6:26 PM MDT
Civil Twilight	6:50 AM MDT	6:51 PM MDT
Nautical Twilight	6:20 AM MDT	7:21 PM MDT
Astronomical Twilight	5:51 AM MDT	7:50 PM MDT
Moon	7:00 AM MDT (10/19)	6:48 PM MDT (10/19)
Length of Visible Light	12h 01m	
Length of Day	11h 09m	

Waning Crescent, 0% of the Moon is Illuminated

Oct 19	Oct 19	Oct 27	Nov 3	Nov 10
Waning Crescent	New	First Quarter	Full	Last Quarter

Hourly Weather History & Observations

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**55.0** °F	**28.0** °F	35%	**29.98** in	**10.0** mi	NW	**6.9** mph	-	N/A		Scattered Clouds
	METAR KABQ 190652Z 32006KT 10SM SCT240 13/M02 A3015 RMK AO2 SLP150 T01281022 402500072										
1:52 AM	**57.0** °F	**24.1** °F	28%	**29.96** in	**10.0** mi	North	**9.2** mph	-	N/A		Mostly Cloudy
	METAR KABQ 190752Z 36008KT 10SM BKN240 14/M04 A3014 RMK AO2 SLP143 T01391044										
2:52 AM	**55.9** °F	**24.1** °F	29%	**29.95** in	**10.0** mi	North	**11.5** mph	-	N/A		Overcast
	METAR KABQ 190852Z 36010KT 10SM OVC220 13/M04 A3014 RMK AO2 SLP142 T01331044 58004										
3:52 AM	**52.0** °F	**27.0** °F	38%	**29.94** in	**10.0** mi	North	**12.7** mph	-	N/A		Mostly Cloudy
	METAR KABQ 190952Z 36011KT 10SM SCT210 BKN300 11/M03 A3013 RMK AO2 SLP138 T01111028										
4:52 AM	**52.0** °F	**26.1** °F	37%	**29.94** in	**10.0** mi	North	**8.1** mph	-	N/A		Overcast
	METAR KABQ 191052Z 36007KT 10SM BKN200 OVC300 11/M03 A3013 RMK AO2 SLP139 T01111033										
5:52 AM	**51.1** °F	**26.1** °F	38%	**29.96** in	**10.0** mi	North	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191152Z 01007KT 10SM SCT190 BKN270 11/M03 A3014 RMK AO2 SLP145 T01061033 10150 20106 55000										
6:52 AM	**51.1** °F	**26.1** °F	38%	**29.98** in	**10.0** mi	North	**5.8** mph	-	N/A		Overcast
	METAR KABQ 191252Z 36005KT 10SM FEW150 OVC190 11/M03 A3014 RMK AO2 SLP150 T01061033										
7:52 AM	**51.1** °F	**27.0** °F	39%	**30.01** in	**10.0** mi	North	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191352Z 36004KT 10SM FEW130 SCT180 BKN270 11/M03 A3015 RMK AO2 SLP162 T01061028										
8:52 AM	**55.9** °F	**28.9** °F	36%	**30.01** in	**10.0** mi	NE	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191452Z 04003KT 10SM FEW130 FEW200 BKN270 13/M02 A3017 RMK AO2 SLP162 T01331017 53009										
9:52 AM	**59.0** °F	**30.9** °F	35%	**30.02** in	**10.0** mi	NW	**3.5** mph	-	N/A		Mostly Cloudy
	METAR KABQ 191552Z 31003KT 10SM FEW130 FEW190 BKN270 15/M01 A3017 RMK AO2 SLP164 T01501006										

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
10:52 AM	62.1 °F	33.1 °F	34%	30.02 in	10.0 mi	WNW	5.8 mph	-	N/A		Mostly Cloudy
	METAR KABQ 191652Z 29005KT 10SM FEW070 FEW190 BKN270 17/01 A3017 RMK AO2 SLP164 T01670006										
11:52 AM	64.0 °F	41.0 °F	43%	29.99 in	10.0 mi	Variable	4.6 mph	-	N/A		Mostly Cloudy
	METAR KABQ 191752Z VRB04KT 10SM FEW060 FEW200 BKN240 18/05 A3016 RMK AO2 SLP156 T01780050 10183 20106 58003										
12:52 PM	70.0 °F	37.0 °F	30%	29.95 in	10.0 mi	Variable	4.6 mph	-	N/A		Mostly Cloudy
	METAR KABQ 191852Z VRB04KT 10SM FEW070 FEW120 SCT200 BKN250 21/03 A3012 RMK AO2 SLP140 VIRGA W T02110028										
1:52 PM	72.0 °F	35.1 °F	26%	29.88 in	10.0 mi	West	3.5 mph	-	N/A		Mostly Cloudy
	METAR KABQ 191952Z 28003KT 10SM FEW080 BKN140 BKN250 22/02 A3008 RMK AO2 SLP119 VIRGA S T02220017										
2:52 PM	73.0 °F	34.0 °F	24%	29.84 in	10.0 mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 192052Z 00000KT 10SM FEW090 BKN140 BKN250 23/01 A3004 RMK AO2 SLP105 T02280011 58036										
3:52 PM	75.0 °F	34.0 °F	22%	29.83 in	10.0 mi	Calm	Calm	-	N/A		Mostly Cloudy
	METAR KABQ 192152Z 00000KT 10SM FEW090 SCT150 BKN250 24/01 A3002 RMK AO2 SLP100 CB DSNT E AND W T02390011										
4:52 PM	73.0 °F	36.0 °F	26%	29.85 in	10.0 mi	WSW	8.1 mph	-	N/A		Mostly Cloudy
	METAR KABQ 192252Z 24007KT 10SM SCT110 BKN160 BKN250 23/02 A3003 RMK AO2 SLP106 T02280022										
5:52 PM	71.1 °F	37.9 °F	30%	29.88 in	7.0 mi	WSW	16.1 mph	-	N/A		Overcast
	METAR KABQ 192352Z 24014KT 7SM BKN100 OVC200 22/03 A3005 RMK AO2 SLP117 T02170033 10244 20178 53003										
6:52 PM	64.9 °F	43.0 °F	45%	29.93 in	7.0 mi	West	19.6 mph	31.1 mph	N/A		Overcast
	METAR KABQ 200052Z 28017G27KT 7SM SCT075 BKN110 OVC200 18/06 A3007 RMK AO2 PK WND 28028/0021 LTG DSNT E-S SLP133 CB DSNT SE-S T01830061										
7:52 PM	61.0 °F	45.0 °F	56%	29.98 in	10.0 mi	WNW	10.4 mph	-	N/A		Overcast
	METAR KABQ 200152Z 29009KT 10SM OVC080 16/07 A3011 RMK AO2 PK WND 29027/0105 LTG DSNT S SLP151 CB DSNT SE-S T01610072										
8:52 PM	57.9 °F	51.1 °F	78%	29.98 in	10.0 mi	SSE	8.1 mph	-	0.00 in	Rain	Light Rain
	METAR KABQ 200252Z 15007KT 10SM -RA SCT050 BKN080 OVC130 14/11 A3012 RMK AO2 RAB05 SLP150 MTNS OBSC NE-SE P0000 60000 T01440106 51020										
9:52 PM	55.9 °F	52.0 °F	87%	29.94 in	10.0 mi	ESE	10.4 mph	-	0.00 in		Overcast

Time (MDT)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 200352Z 11009KT 10SM OVC110 13/11 A3009 RMK AO2 RAE0256 SLP138 P0000 T01330111										
10:52 PM	**57.9** °F	**50.0** °F	75%	**29.92** in	**10.0** mi	Variable	**3.5** mph	-	N/A		Overcast
	METAR KABQ 200452Z VRB03KT 10SM BKN110 OVC200 14/10 A3008 RMK AO2 SLP131 T01440100										
11:52 PM	**55.9** °F	**50.0** °F	80%	**29.92** in	**10.0** mi	SSW	**4.6** mph	-	N/A		Mostly Cloudy
	METAR KABQ 200552Z 21004KT 10SM SCT100 BKN150 13/10 A3008 RMK AO2 SLP130 60000 T01330100 10211 20128 56011										

| |

Albuquerque, NM

Albuquerque International Sunport

8:18 AM MST on January 02, 2018 (GMT -0700)

Weather History for KABQ - December, 2017

December

7

2017

View

Thursday, December 7, 2017

Daily | Weekly | Monthly | Custom

	Actual	Average	Record
Temperature			
Mean Temperature	**30** °F	**37** °F	
Max Temperature	**37** °F	**47** °F	**66** °F (1981)
Min Temperature	**22** °F	**27** °F	**3** °F (1912)
Degree Days			
Heating Degree Days	35	28	
Month to date heating degree days	156	188	
Since 1 July heating degree days	725	1055	
Cooling Degree Days	0	0	

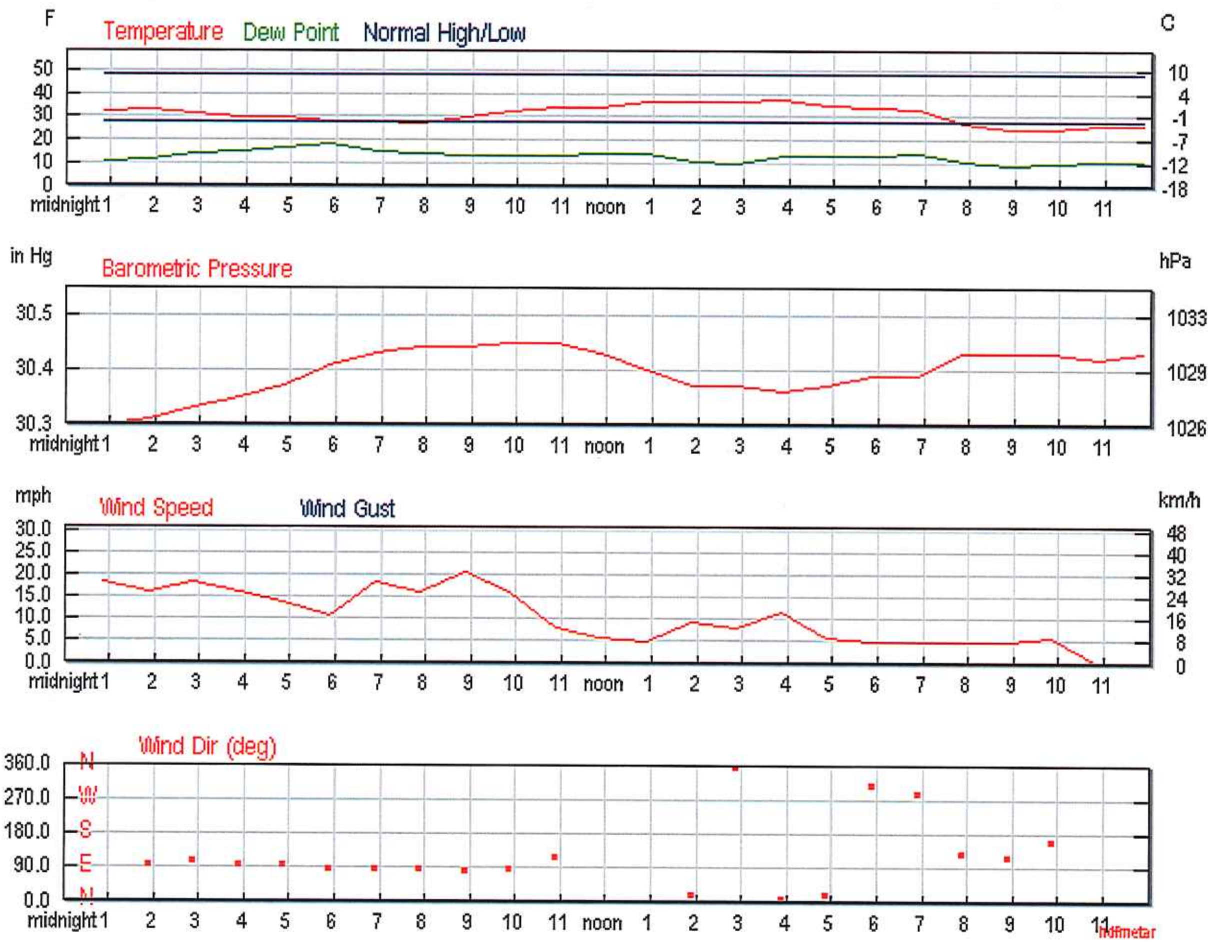
	Actual	Average	Record
Month to date cooling degree days	0	0	
Year to date cooling degree days	1557	1322	
Moisture			
Dew Point	**12** °F		
Average Humidity	50		
Maximum Humidity	68		
Minimum Humidity	32		
Precipitation			
Precipitation	**T** in	**0.01** in	**0.20** in (1998)
Month to date precipitation	T	0.12	
Year to date precipitation	7.67	9.07	
Snow			
Snow	**T** in	-	- ()
Month to date snowfall	T		
Since 1 July snowfall	T		
Snow Depth	**0.00** in		
Sea Level Pressure			
Sea Level Pressure	**30.40** in		
Wind			
Wind Speed	**10** mph (East)		
Max Wind Speed	**24** mph		
Max Gust Speed	**30** mph		
Visibility	**10** miles		

	Actual	Average	Record
Events	Snow		

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Daily Weather History Graph



Search for Another Location

Airport or City:

KABQ

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

December

7

Submit

Astronomy

Dec. 07, 2017	**Rise**	**Set**
Actual Time	7:01 AM MST	4:54 PM MST
Civil Twilight	6:33 AM MST	5:22 PM MST
Nautical Twilight	6:02 AM MST	5:54 PM MST
Astronomical Twilight	5:31 AM MST	6:24 PM MST

Moon	9:40 PM MST (12/7)	10:46 AM MST (12/7)
Length of Visible Light	10h 48m	
Length of Day	9h 53m	

Waning Gibbous, 77% of the Moon is Illuminated

Dec 7	Dec 10	Dec 17	Dec 26	Jan 1
Waning Gibbous	Last Quarter	New	First Quarter	Full

Hourly Weather History & Observations

Time (MST)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:52 AM	**30.9** °F	**19.1** °F	**10.0** °F	42%	**30.30** in	**10.0** mi	East	**18.4** mph	-	N/A		Partly Cloudy
	METAR KABQ 070752Z 09016KT 10SM FEW020 FEW070 M01/M12 A3031 RMK AO2 SLP260 MTNS OBSC E T10061122											
1:52 AM	**32.0** °F	**21.2** °F	**10.9** °F	42%	**30.31** in	**10.0** mi	East	**16.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 070852Z 10014KT 10SM FEW020 FEW050 BKN070 00/M12 A3033 RMK AO2 SLP264 MTN TOPS OBSC NE-E T00001117 53006											
2:52 AM	**30.0** °F	**17.9** °F	**12.9** °F	49%	**30.33** in	**10.0** mi	ESE	**18.4** mph	-	N/A		Overcast
	METAR KABQ 070952Z 11016KT 10SM FEW015 SCT040 OVC060 M01/M11 A3034 RMK AO2 PK WND 09026/0908 SLP270 MTNS OBSC NE-SE T10111106 $											
3:52 AM	**28.9** °F	**17.3** °F	**14.0** °F	54%	**30.35** in	**10.0** mi	East	**16.1** mph	-	N/A		Overcast
	METAR KABQ 071052Z 10014KT 10SM FEW040 BKN060 OVC080 M02/M10 A3034 RMK AO2 SLP275 MTN TOPS OBSC NE AND SE T10171100 $											
4:52 AM	**28.9** °F	**18.2** °F	**16.0** °F	58%	**30.37** in	**10.0** mi	East	**13.8** mph	-	N/A		Overcast
	METAR KABQ 071152Z 10012KT 10SM FEW035 SCT055 BKN070 OVC140 M02/M09 A3036 RMK AO2 SLP284 MTN TOPS OBSC NE AND SE T10171089 10000 21017 53008 $											
5:52 AM	**27.0** °F	**17.3** °F	**17.1** °F	66%	**30.41** in	**10.0** mi	East	**10.4** mph	-	N/A		Scattered Clouds
	METAR KABQ 071252Z 09009KT 10SM FEW030 SCT060 SCT085 M03/M08 A3037 RMK AO2 SLP298 MTNS OBSC SE T10281083											
6:52 AM	**27.0** °F	**13.9** °F	**14.0** °F	58%	**30.43** in	**10.0** mi	East	**18.4** mph	-	N/A		Mostly Cloudy
	METAR KABQ 071352Z 09016KT 10SM FEW020 BKN060 BKN080 M03/M10 A3039 RMK AO2 SLP305 MTNS OBSC NE-SE SHSN DSNT NE-SE-S AND W T10281100											
7:52 AM	**26.1** °F	**13.6** °F	**12.9** °F	58%	**30.44** in	**10.0** mi	East	**16.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 071452Z 09014KT 10SM FEW035 SCT050 SCT080 M03/M11 A3038 RMK AO2 SLP307 MTNS OBSC NE AND SE SHSN DSNT NE AND SE AND SW T10331106 50008											
8:52 AM	**28.9** °F	**15.8** °F	**12.0** °F	49%	**30.44** in	**10.0** mi	East	**20.7** mph	-	N/A		Partly Cloudy
	METAR KABQ 071552Z 08018KT 10SM FEW040 FEW080 M02/M11 A3039 RMK AO2 SLP308 MTN TOPS OBSC NE AND SE T10171111											
9:52 AM	**30.9** °F	**19.8** °F	**12.0** °F	46%	**30.45** in	**10.0** mi	East	**16.1** mph	-	N/A		Partly Cloudy
	METAR KABQ 071652Z 09014KT 10SM FEW040 M01/M11 A3041 RMK AO2 SLP312 VCSH NE MTN TOPS OBSC NE AND SE T10061111											
10:52 AM	**33.1** °F	**26.1** °F	**12.0** °F	42%	**30.45** in	**10.0** mi	ESE	**8.1** mph	-	N/A		Mostly Cloudy
	METAR KABQ 071752Z 12007KT 10SM BKN043 01/M11 A3040 RMK AO2 SLP309 VCSH NE AND SE MTN TOPS OBSC NE AND SE T00061111 10006 21033 50006											

Time (MST)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
11:52 AM	**33.1** °F	**27.7** °F	**12.9** °F	43%	**30.43** in	**10.0** mi	Variable	**5.8** mph	-	**0.00** in	Snow	Light Snow
	METAR KABQ 071852Z VRB05KT 10SM -SN BKN055 01/M11 A3038 RMK AO2 SNB49 SLP302 VIRGA MTNS OBSC NE AND SE P0000 T00061106											
12:52 PM	**35.1** °F	**31.0** °F	**12.9** °F	40%	**30.40** in	**10.0** mi	Variable	**4.6** mph	-	**0.00** in		Mostly Cloudy
	METAR KABQ 071952Z VRB04KT 10SM BKN048 02/M11 A3036 RMK AO2 SNE25 SLP292 VIRGA VCSH NE-SE MTN TOPS OBSC NE-SE P0000 T00171106											
1:52 PM	**35.1** °F	**27.9** °F	**10.0** °F	35%	**30.37** in	**10.0** mi	NNE	**9.2** mph	-	N/A		Mostly Cloudy
	METAR KABQ 072052Z 02008KT 10SM BKN055 BKN070 02/M12 A3034 RMK AO2 SLP284 VIRGA VCSH NE-SE MTNS OBSC NE-SE 60000 T00171122 56018											
2:52 PM	**35.1** °F	**28.6** °F	**9.0** °F	34%	**30.37** in	**10.0** mi	North	**8.1** mph	-	N/A		Scattered Clouds
	METAR KABQ 072152Z 36007KT 10SM FEW045 SCT060 SCT085 02/M13 A3033 RMK AO2 SLP284 VIRGA VCSH SE MTNS OBSC SE T00171128											
3:52 PM	**36.0** °F	**28.0** °F	**12.0** °F	37%	**30.36** in	**10.0** mi	North	**11.5** mph	-	N/A		Partly Cloudy
	METAR KABQ 072252Z 01010KT 10SM FEW050 02/M11 A3033 RMK AO2 SLP281 T00221111											
4:52 PM	**34.0** °F	**28.8** °F	**12.0** °F	40%	**30.37** in	**10.0** mi	NNE	**5.8** mph	-	N/A		Partly Cloudy
	METAR KABQ 072352Z 02005KT 10SM FEW050 01/M11 A3032 RMK AO2 SLP283 60000 T00111111 10028 20000 56005											
5:52 PM	**33.1** °F	**28.7** °F	**12.0** °F	42%	**30.39** in	**10.0** mi	NW	**4.6** mph	-	N/A		Partly Cloudy
	METAR KABQ 080052Z 31004KT 10SM FEW050 01/M11 A3033 RMK AO2 SLP289 T00061111											
6:52 PM	**32.0** °F	**27.5** °F	**12.9** °F	45%	**30.39** in	**10.0** mi	WNW	**4.6** mph	-	N/A		Clear
	METAR KABQ 080152Z 29004KT 10SM CLR 00/M11 A3034 RMK AO2 SLP291 T00001106											
7:52 PM	**26.1** °F	**20.5** °F	**10.0** °F	51%	**30.43** in	**10.0** mi	SE	**4.6** mph	-	N/A		Clear
	METAR KABQ 080252Z 13004KT 10SM CLR M03/M12 A3034 RMK AO2 SLP303 T10331122 51004											
8:52 PM	**23.0** °F	**17.0** °F	**8.1** °F	53%	**30.43** in	**10.0** mi	ESE	**4.6** mph	-	N/A		Partly Cloudy
	METAR KABQ 080352Z 12004KT 10SM FEW200 M05/M13 A3034 RMK AO2 SLP305 T10501133											
9:52 PM	**23.0** °F	**15.8** °F	**9.0** °F	55%	**30.43** in	**10.0** mi	SSE	**5.8** mph	-	N/A		Partly Cloudy
	METAR KABQ 080452Z 16005KT 10SM FEW200 M05/M13 A3035 RMK AO2 SLP304 T10501128											
10:52 PM	**25.0** °F	-	**10.0** °F	53%	**30.42** in	**10.0** mi	Calm	Calm	-	N/A		Partly Cloudy

Time (MST)	Temp.	Windchill	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KABQ 080552Z 00000KT 10SM FEW200 M04/M12 A3035 RMK AO2 SLP301 T10391122 10011 21056 51005											
11:52 PM	**25.0** °F	-	**10.0** °F	53%	**30.43** in	**10.0** mi	Calm	Calm	-	N/A		Partly Cloudy
	METAR KABQ 080652Z 00000KT 10SM FEW200 M04/M12 A3036 RMK AO2 SLP303 T10391122 400281056											

| |

Attachment 8

Education and Outreach Outcomes Report

Mid Rio Grande Stormwater Quality Team
www.keeptheriogrand.org

Outcomes Report

for

Fiscal Year 2017-2018

(July 1, 2017 - June 30, 2018)

presented by

Phyllis Baker

CWA Strategic Communications

During the period from July 1, 2017 through June 30, 2018, the Mid Rio Grande Stormwater Quality Team (MRGSQT) continued its educational partnerships with the Bosque Ecosystem Monitoring Program (B.E.M.P.) and RiverXchange. The team continued to post relevant information to its website and Facebook page, and also participated in a number of high-profile community events, including the Corrales Harvest Festival, New Mexico's Animal Humane Society's Doggie Dash and Dawdle, and the KOB TV Health & Wellness Fair. The team's interactive kiosk continued its successful run at Rio Rancho's Loma Colorado Public Library. Community outreach continued with various events throughout the year. The team rewrote and produced new print materials on a variety of MS4-related topics, including proper hazardous waste disposal, proper pet waste disposal, stormwater pollution reduction and awareness of hazardous on-the-job chemicals. Updates and improvements to the team's website **keeptheriogrand.com** began.

Team partners and supporters disseminated information on stormwater quality and pollution prevention through municipal water quality reports to stakeholders. Specialty advertising giveaways relating to stormwater quality awareness were ordered/reordered for use at public events. MRGSQT's annual budget for all these activities, excluding Type 9 items, donated hours by team members, and funding for Arroyo Classroom, RiverXchange and B.E.M.P., is $50,000. The contractor, CWA Strategic Communications, donated $2,328.19 in services during the 12-month period. We have summarized the activities below and on the following pages:

WEBSITE (www.keeptheriogrand.org)

The Team contracted with CWA Strategic Communications to redesign the website and the new site is expected to roll out in October 2018. Content and links have been updated and new material added. The site will be more user-friendly and offer Team members an easy way to upload, store and share materials.

FACEBOOK PAGE

In conjunction with the SQT website, a Facebook page contains posts and updated information at: (https://www.facebook.com/Keeptheriogrand). The page has 141 "Likes" and the Team occasionally boosts posts during events to obtain more visibility.

Estimated number of individuals reached by this activity: 141
Permit Reference(s): General SWP, Construction, Pet Waste
Audience(s): Children, Adults

EVENTS

Between July 1, 2017 and June 30, 2018, MRGSQT members and their partner agencies reported participating in a total of 72 community outreach/educational events reaching 28,626 adults and children. ***Details can be found in Exhibit 1 at the end of this report.***

Estimated number of individuals reached by these community outreach/education events (with duplications): 28,626
Permit Reference(s): General SWP, Construction, Pet Waste, Construction, Household Hazardous Waste, Illicit Discharge and Animal Sources
Audience(s): Children, Adults

GENERAL MATERIALS DISTRIBUTION

As appropriate, team members distribute materials at events. Following are inventories of materials on hand from July 1, 2017 through June 30, 2018.

Total estimated number of people reached by these activities: 4,181
Cost per person reached (may be some duplication): $0.60
Permit Reference(s): General SWP, Pet Waste, Household Hazardous Waste
Audience(s): Children, Adults

STORMWATER QUALITY TEAM Inventory					
Item	**Starting Qty as of 7/1/2017**	**Quantity**	**Distributed**	**Ending Qty as of 6/30/2018**	**Cost of Materials Distributed**
"Keep the Rio Grand" Bumper Stickers	798		48	750	$48.00
"Reduce Stormwater Pollution at Home" brochure	170		70	100	$10.00
SQT Brochure - "New Dog or Cat"	2,620		510	2,110	$76.50
Dog-shaped Poop Bag Dispensers	426		340	2,586	$638.66
"Don't Contaminate the River" stickers	1,040		780	260	$148.20
Poo Emoji Squeezies	4,570		430	3,840	$656.61
Morphing Fish Bags (added 1500 more on 8/31/2017)	187	1,500	770	917	$2,816.12
Silicone Pet Food Can lids (added 8/31/2017)		2,500	733	1,767	$833.86
New Pet Rack Cards (added 6/1/18)		5,000	100	4,900	$8.45
FOG Rack Cards (added 6/1/18)		5,000	100	4,900	$8.45
No Poop Fairy Rack Cards (added 6/1/18)		5,000	100	4,900	$8.45
Professionals Harmful Chemicals Rack Card (added 6/1/18)		5,000	100	4,900	$8.45
Reduce Stormwater Pollution at Home Rack Card (added 6/1/18)		5,000	100	4,900	$8.45
Large Stormwater display - 8 ft (updated 6/1/18)	1				$1,155.00
Tabletop Stormwater display - 6 ft (added 6/1/18)	1				$480.00
			4,181		**$2,511.11**

The SQT invested in a smaller tabletop display to take to events with limited space. The larger 8 ft. standing display was also updated with new panels featuring updated information.

EDUCATIONAL ACTIVITIES

Educational Kiosk at Rio Rancho's Main Loma Colorado Library.

The kiosk remained at Rio Rancho's main library through April 2018 and continued to educate citizens (primarily children) about stormwater issues. The kiosk features:

- An interactive stormwater system map where children can press various points to learn the roles arroyos and channels play in the stormwater system and how to keep from polluting that system. The system stretches from Bernalillo on the north through Rio Rancho and into Albuquerque.
- A "Scoop the Poop" game that lets children choose one of three dogs and learn how to properly pick up after that dog. This is important because pet waste is a major source of *E coli* contamination in the Rio Grande.
- An educational panel on common types of trash, debris and chemicals that pollute the Rio Grande including appliances and electronics, automotive products such as oil, batteries and gasoline, glass and cement, household cleaners, yard waste, prescription and over-the-counter medicines.
- A touch screen that includes facts about each arroyo and the Rio Grande.

Stormwater Quality Team Creates Interactive Kiosk for Children

Maps, Games and Videos Highlight Stormwater Runoff System and Its Link to Rio Grande

The Mid Rio Grande Stormwater Quality Team has created a kiosk to teach children about our area's stormwater runoff system and what they can do to keep from polluting that system and the Rio Grande. The three-sided kiosk, which debuted at the Downtown Children's Library, uses touch and video screens to engage and teach children that everything entering the stormwater system can end up in the Rio Grande – and provides practical tips on what they can do to keep our river clean.

The three-sided kiosk uses interactive screens to engage and teach kids that "all roads lead to the Rio Grande" and offers information on how people can help keep the river clean.

INTERACTIVE STORMWATER SYSTEM MAP Children can press various points on a map to learn the role various arroyos and channels play in our stormwater system and how to keep from polluting that system.

"SCOOP THE POOP" GAME Children can select the dog they want and learn how to pick up after that dog. Information panels explain how to properly dispose of dog and cat waste and also explore common types of hazardous materials that pollute the Rio Grande, endangering the wildlife and people who rely on the river.

INTERACTIVE EDUCATIONAL SCREEN allows children to watch a variety of educational videos produced by the Stormwater Team and reminds them that everything they throw on the ground flows to the Rio Grande.

For more information visit **www.keeptheriogrand.org**

JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY/ JUNE	**TOTAL**
18,456	19,712	16,147	16,173	14,877	12,411	17,274	18,470	18,428	15,486	N/A	**167,434**

Total number of children and adults viewing the kiosk from July 1, 2017 through April 30, 2018. Numbers for May and June, 2018 were not available at the time this report was compiled.

Plans are in the works to upgrade the kiosk, change the software platform of the games for easier access and analytic tracking and conduct some repairs on existing hardware.

STUDENTS AND TEACHERS REACHED THROUGH PARTNER EDUCATIONAL PROGRAMS – ARROYO CLASSROOM, RIVERXCHANGE AND BOSQUE ECOSYSTEM MONITORING PROGRAM (B.E.M.P.)

Arroyo Classroom

The Arroyo Classroom program utilizes natural arroyos as outdoor classrooms and brings local animals into the classroom to motivate third graders to respect the arroyos as important wildlife habitat. In the 2017-2018 school year, the program served 33 classes within the Rio Rancho Public School System, reaching approximately 33 teachers and 770 students.

For more information, see Exhibit 2, Arroyo Classroom's 2017-2018 report to the Mid Rio Grande Stormwater Quality Team.

RiverXchange
RiverXchange is an innovative, long-term outreach program that integrates water resource topics with computer technology, student writing, and a hands-on curriculum to meet specific, measurable outcomes.

Since 2007, the program has enabled upper elementary classes from New Mexico to become "high tech pen pals" with classes outside the state to share what they learn about the geography, culture, and ecology of their local river and watershed. Including these partner classes, the program has served over 14,000 students. Each student spends about 25 hours engaged with the program over the course of the school year. The curriculum incorporates hands-on activities, and multiple classroom presentations by local water resources experts. During the 2017-2018 season, 39 fifth-grade classes, most of which were Title I schools (1,188 students and 42 teachers) participated in New Mexico. RiverXchange conducted 20 classes (612 students) in Bernalillo County and 19 classes (576 students) in Sandoval County

For more information, see Exhibit 3, RiverXchange's 2017-2018 report to the Mid Rio Grande Stormwater Quality Team.

B.E.M.P.
The main objective of the *Stormwater Science* outreach education program of the Bosque Ecosystem Monitoring Program (B.E.M.P.) is to teach students that the health of the Rio Grande is directly related to the health of the surrounding watershed. The *Stormwater Science* program includes a one and one-half hour classroom activity, and a 4-5 hour study trip to the Rio Grande. During the 2017-2018 school-year 2,247 students participated in *Stormwater Science* activities in their classrooms, in the field or both. The classroom program was delivered to 1,517 students in 30 classrooms at 19 different schools in Rio Rancho, Albuquerque, and Belen. See ***Exhibit 5*** for the BEMP Report on the 2017-2018 school year and its *Stormwater Science* report.

For more information, see Exhibit 4, B.E.M.P.'s 2017-2018 report to the Mid Rio Grande Stormwater Quality Team.

Total estimated number of people reached by these educational activities: 173,231
Permit Reference(s): General SWP, Pet Waste, Animal Sources, Household Hazardous Waste, Illicit Discharges
Audience(s): Children, Adults

PUBLIC EDUCATION CAMPAIGNS ON PROPER DISPOSAL OF FATS, OILS & GREASE

In November and December 2016, the City of Rio Rancho and the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) planned and implemented public education campaigns on how to dispose of cooking grease properly. The campaigns were timed to coincide with the holiday cooking season (Thanksgiving through Christmas). The City of Rio Rancho campaign included:

Print Ads – Two (red, green) small ads ran twice in one issue of the *Observer* the Sunday before Thanksgiving (11/19) reaching approximately 60,000 readers (with duplication).

Digital Outdoor Boards – 5 digital outdoor boards ran one week in November (11/20-11/26), alternating the red and green boards. Two of those boards ran an additional week (11/27-12/3). 7 boards ran in December the week before Christmas (12/18-12/24). A total estimated audience of 181,648 adults (18 years of age and older) with duplication was reached.

Movie Theaters – One 30-second spot played 750 times in Rio Rancho's 14-plex Premiere Theater for one week in November (12/15-12/21) and two weeks in December (12/15-12/28) reaching approximately 30,000 people with duplication.

In addition, the City of Rio Rancho published an article in its Fall 2017 newsletter. "Beware the Holiday FOG!" offered information about the damage fats, oils and grease can do to sewer mains to the newsletter's 37,000 mail recipients.

Total estimated audience reached (with duplication): 308,648

Beware the Holiday FOG!

FATS, OILS, AND GREASE (FOG) are a costly sewer problem for municipalities, and the FOG problem is much worse during the holiday season. Grease and fats that are put down drains or in the toilet solidify and can create "fatbergs." They can clog customer sewer lines causing raw sewage to back up into the homes and these fatbergs can also clog the large sewer mains causing overflows of raw sewage.

A recent article in the New York Times tells about a fatberg in London. The London fatberg is 1/6 of a mile long and weighs more than 140 tons. To see a photo and read the article about the fatberger visit **https://nyti.ms/2eVZyk6**

Disposable wipes, baby diapers, and feminine hygiene products make the fatbergs more solid; like a rock in some cases. ***All of these products, including flushable wipes, should be put in the trash, not down the toilet.***

Keep your holidays clean from backups; dispose of FOG in the trash. ***Cool It. Can It. Trash It.***

Get Your **FREE**
"Cease the Grease"
Spatula*

Stop by the Utilities Department Environmental Programs
(City Hall Room 250)

****While supplies last***

Rio Rancho Utilities :: Fall 2017 :: 3

The Albuquerque Bernalillo Water Utility Authority (a Stormwater Team supporter) expanded its annual holiday campaign on Fats, Oils & Grease in the fall of 2017 to include messages about what not to flush down the toilet (trash and flushable wipes) as well as what not to place down the sink (grease). New outdoor boards, a new television spot and a new radio spot were created, along with a bill insert stuffer mailed to the Water Authority's customers. The campaign, which ran in November, December, January and February, reached the following audiences:

Bill Insert – ran in December, January and February – estimated reach 210,000 bill inserts per month = 630,000 adults with duplication.

Radio spot – 600 30-second radio spots reaching a targeted audience of women 25-64, with a total reach of 180,200 with duplication.

Television spot – 1,418 spots reaching an estimated audience of 1,098,510 with duplication.

Outdoor – Digital messages ran on 4 outdoor boards for 2 weeks in November (around Thanksgiving) and in December (around Christmas). Total estimated reach was 1,013,420 with duplication.

Total audience reached (with duplication): 2,922,130

PRINT MATERIALS

The Stormwater Quality Team created a series of rack cards addressing specific MS4 Permit issues:

- ***Reducing Stormwater Pollution at Home –*** for residential use
- ***Keep Harmful Chemicals from Entering Storm Drains –*** for professionals dealing with hazardous chemicals
- ***Dispose of Fats, Oils & Grease (FOG) Properly –*** for residential and professional use
- ***Don't Poo-Poo the Rio! –*** a handout for new pet owners, to be distributed at animal control and animal rescue organizations
- ***There IS NO Poop Fairy! –*** a general handout about proper pet waste disposal

These materials are distributed at public events and also at appropriate venues such as animal rescue organizations, libraries, city halls, etc.

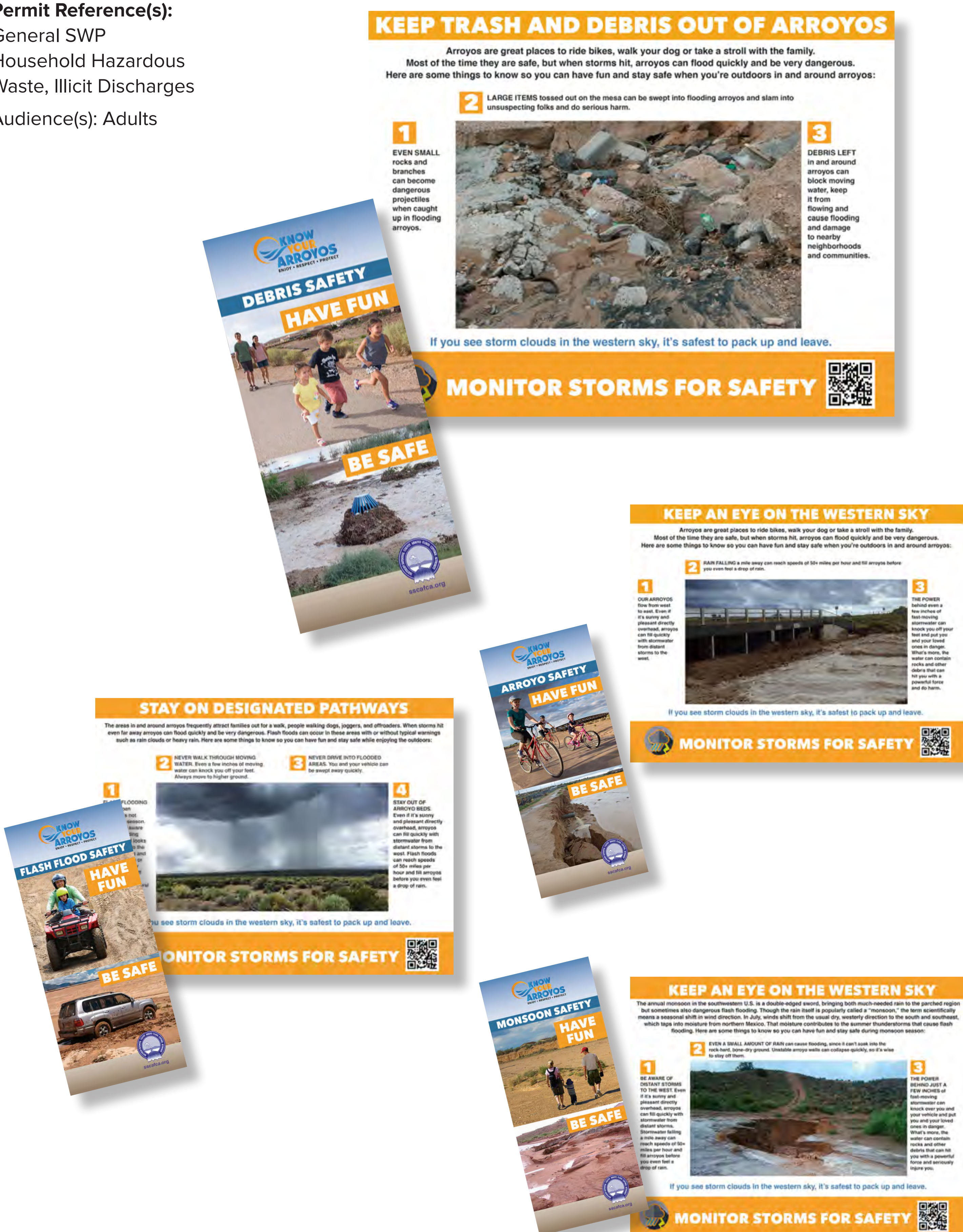
Permit Reference(s):
General SWP, Pet Waste, Animal Sources, Household Hazardous Waste, Illicit Discharges

Audience(s):
Children, Adults

SSCAFCA, a MRSQT member, produced several brochures as part of its Arroyo Safety campaign.

Permit Reference(s):
General SWP
Household Hazardous
Waste, Illicit Discharges

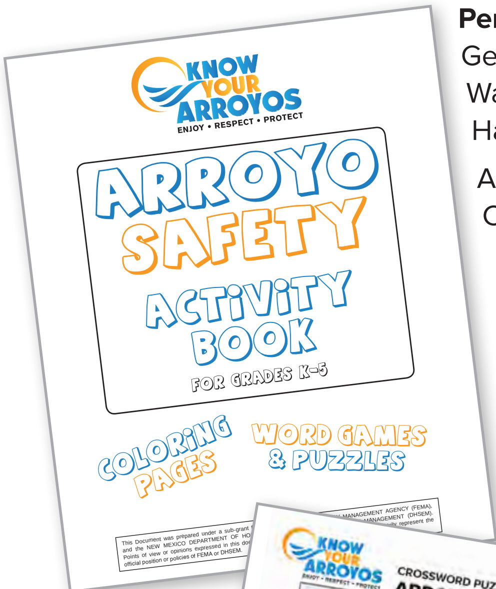
Audience(s): Adults

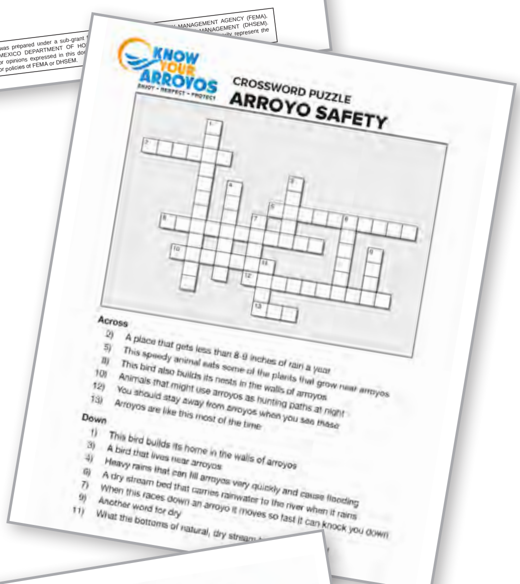


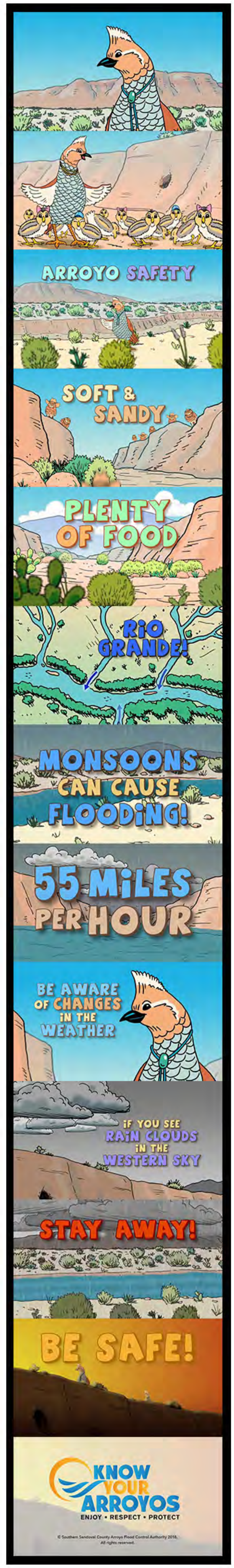
SSCAFCA also produced two animations for children. One is entitled Arroyo Safety and the other is called "Respect Your Arroyos." The videos are shown in elementary school classes and are accompanied by an activity workbook that reinforces the information addressed in the animations with coloring pages and word games.

Permit Reference(s): General SWP, Pet Waste, Household Hazardous Waste

Audience(s): Children







HOUSEHOLD HAZARDOUS WASTE COLLECTION

Household Hazardous Waste Diverted from Landfill

MONTH	MEMBER	POUNDS COLLECTED	POUNDS RECYCLED
2017			
July	City of Albuquerque	52,381	50,506
August	“	39,319	36,897
September	“	29,165	27,875
October	“	44,614	42,504
November	“	35,360	33,106
December	“	26,745	24,647
2018			
January	“	27,592	24,527
February	“	22,297	20,314
March	“	32,635	31,366
April	“	49,004	43,673
May	“	37,907	36,152
June	“	28,498	25,876
TOTAL	**“**	**425,517**	**350,136**

DONATIONS

The City Of Albuquerque donated $65,000 to organizations for additional educational and training programs:

MEMBER	AMOUNT DONATED	RECIPIENT	PURPOSE
City of Albuquerque	$45,000	The Nature Conservancy	For Education and Outreach
“	$20,000	Earth Force	For Education and Outreach

ESTIMATED TOTAL NUMBER OF PEOPLE REACHED THROUGH ALL ADVERTISING, EDUCATIONAL AND PUBLIC OUTREACH ACTIVITIES DURING 2016-2017:

Obviously, some people were reached by more than one activity, but in gross numbers an estimated **3,434,957** people were reached with a stormwater quality/stormwater pollution prevention message during the 2017-2018 fiscal year.

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
2017					
Earth Day Puesta Del Sol Elementary-Enviroscape Demo	4/20/17	Elementary School students	SWP	600	
MS4 permit presentation-Rotary Club in Albuquerque	4/20/17	Adults	SWP	40	
Enviroscape Presentation-Mom's Group at Tijeras Creek Restoration Project	7/11/17	Adults	SWP	20	
Rolling River Presentation-Isleta Pueblo Environmental Fair	7/15/17	All Ages	SWP	50	
Rolling River Presentation-Water Day at Railyards Market	7/16/17	All Ages	SWP	100	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 500 Balloon Fiesta Pkwy NE area	8/19/17	Adults	HHW	401	Collected, segregated, packaged, labeled, transported and disposed of 26,218 pounds of Household Hazardous Waste, and 3,600 pounds of Non-Regulated Solid Waste (an average of 74.35 pounds of waste per customer).
Enviroscape Presentation-East Mountain Celebration (with TCRP tours)	9/24/17	All Ages	SWP	50	
Rolling River Presentation-Valle de Oro 5th Birthday	9/30/17	All Ages	SWP	125	
Corrales Harvest Fest	9/30/17	All Ages	SWP	8,000	
Rolling River Presentation-RMYC at TCRP	10/2/17	All Ages	SWP	125	
Rolling River Presentation-RMYC at TCRP	10/3/17	All Ages	SWP		
Rolling River Presentation-John Adams and Jimmy Carter MS at Valle de Oro	10/6/17	Middle School students	SWP	33	
Rolling River Presentation-Atrisco Academy HS, Ernie Pyle MS at Valle de Oro	10/9/17	Middle School students	SWP	50	
Rolling River Presentation-Van Buren HS at Valle de Oro	10/11/17	High School students	SWP	39	
Rolling River Presentation-TCRP field trip tour - Carlito Springs	10/19/17	All Ages	SWP		
Rolling River Presentation-Rio Rancho Children's Water Festival	10/23/17	Fourth grade students	SWP	75	
Rio Rancho Children's Water Festival	10/23-24/2017	Elementary Students and Teachers	SWP	1,672	
Enviroscape Presentation-TCRP field trip tour - Carlito Springs	10/25/17	All Ages	SWP		
Animal Humane's Doggie Dash and Dawdle	10/31/17	All Ages	AS, PW, SWP	4,000	Animal Humane's signature event and largest fundraiser
Rolling River Presentation-RMYC at TCRP	11/13/17	All Ages	SWP		
UNM Water Student Group	11/30/17	College Students	SWP	35	

AS: Animal Sources
CON: Construction
HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RiverXChange, Georgia O'Keefe	12/14/17	Students, Adults	SWP	52	75 Shrubs Planted
2018					
RiverXChange, Vista Elem.	1/11/18	Students, Adults	SWP	66	78 Shrubs Planted
Holy Ghost	1/18/18	Students, Adults	SWP	47	42 Shrubs, 10 Cottonwoods Planted
RiverXChange, Monte Vista	1/25/18	Students, Adults	SWP	31	14 Cottonwoods Planted
RiverXChange, Bern Co/ O'Keefe	1/26/18	Students, Adults	SWP	59	29 Cottonwoods Planted
Assisted MRGCD with planting	1/27/18	Youth, Adults	SWP	184	Cottonwoods, Coyote Willows and Goodings Willows Planted
MRGCD/Fish & Wildlife at Glass Gardens	1/27/18	All Ages	SWP	184	110 Plants and caging
KOB Health and Wellness Fair at EXPO NM	1/27/18-1/28/2018	All Ages	HHW, PW, SWP	8,000	Annual event focusing on wellness; handed out giveaways,surveys
Nahalat Jewish Congregation	1/28/18	Adult		1	8 Cottonwoods Planted
Rolling River Presentation-Jefferson Middle School - Science Night	1/29/18	Middle School students	SWP		
GIOS Hubert Humphrey Elem. 4th grade	2/2/18	Students, Adults	SWP	26	20 Cottonwoods Planted
Former Peace Corps	2/3/18	Youth, Adults	SWP	83	100 Cottonwoods, 30 Shrubs Planted
RiverXChange, Colinas del Norte	2/6/18	Students, Adults	SWP	57	23 Cottonwoods Planted
RiverXChange, Martin Luther King	2/8/18	Students, Adults	SWP	56	40 Cottonwoods Planted
RiverXChange, John Baker	2/9/18	Students, Adults	SWP	53	48 Cottonwoods Planted
Roots and Shoots	2/10/18	Youth, Adults	SWP	15	25 Cottonwoods/9 Shrubs Planted
GIOS Helen Cordero School	2/16/18	Children, Adults	SWP	27	45 Twigs Planted
GIOS Explore Academy	2/19/18	Students, Adults	SWP	10	37 Cottonwoods Planted
RiverXChange, Sandia Vista	2/20/18	Students, Adults	SWP	32	30 Cottonwoods Planted
RiverXChange, NM Connections	2/21/18	Students, Adults	SWP	24	25 Cottonwoods Planted
Holy Ghost	2/22/18	Students, Adults	SWP	31	100 Cottonwoods Planted
RiverXChange, John Baker	2/23/18	Students, Adults	SWP	63	50 Cottonwoods Planted
UNM Pathways	2/24/18	Youth, Adults	SWP	69	105 Cottonwoods/30 shrubs Planted
GIOS Inez Elem. 5th grade	2/26/18	65 students/9 adults	SWP	74	45 Cottonwoods Planted
RiverXChange, Osuna	2/28/18	54 students/8 adults	SWP	62	40 Cottonwoods Planted
RiverXChange, Rio Rancho Elem	3/1/18	54 students/7 Adults	SWP	61	40 Cottonwoods Planted
Family and Friends	3/1/18	Children, Adults	SWP	10	30 Cottonwoods & Black Willows Planted
RiverXChange, Rio Rancho Elem	3/2/18	57 students/9 Adults	SWP	56	33 Cottonwoods Planted
RiverXChange, MLK	3/6/18	54 students/9 Adults	SWP	63	39 Cottonwoods & Black Willows Planted
Bosque School	3/8/18	17 Students/3 Adults	SWP	20	12 Cottonwoods & Black Willows Planted
Bosque School	3/8/18	18 Students/4 Adults	SWP	22	12 Cottonwoods & Black Willows Planted
Bosque School	3/9/18	18 Students/4 Adults	SWP	22	13 Cottonwoods & Black Willows Planted
Bosque School	3/9/18	18 Students/3 Adults	SWP	21	20 Cottonwoods & Black Willows Planted
Sandia Civitans	3/10/18	1 Youth/ 11 Adults	SWP	12	36 Cottonwoods & Black Willows Planted

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NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RR Schools	3/10/18	46 Students/6 Adults	SWP	52	22 Cottonwoods & Black Willows Planted
RiverXChange, Rio Rancho Elem	3/13/18	Students, Adults	SWP	31	50 Cottonwoods Planted
RiverXChange, MLK	3/20/18	Students, Adults	SWP	58	24 Cottonwoods Planted
RiverXChange, Osuna/ Bandelier	3/21/18	Students, Adults	SWP	45	35 Cottonwoods Planted
RiverXChange, Colinas del Norte	3/22/18	Students, Adults	SWP	59	26 Cottonwoods Planted
RiverXChange, Colinas del Norte	3/23/18	Students, Adults	SWP	31	20 Cottonwoods Planted
Rolling River Presentation-Taft and Taylor MS at Valle de Oro	4/6/18	Middle School students	SWP	46	
Rolling River Presentation-UNM Sustainability Expo	4/19/18	College students	SWP	250	
Rolling River Presentation-Earth Day at Annunciation Catholic School	4/20/18	Elementary and Middle School students	SWP		
Rolling River Presentation-Cancer Services of NM Spring Retreat	4/21/18	All Ages	SWP	30	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 6137 Edith Blvd. NE area at	4/21/18	Adults	HHW	415	Collected, segregated, packaged, labeled, transported and disposed of 27,017 pounds of Household Hazardous Waste, and 3,200 pounds of Non-Regulated Solid Waste (an average of 72.81 pounds of waste per customer).
Rolling River Presentation-BEMP Student Congress	4/27/18	High School students	SWP		
Rolling River Presentation-Native Fish in the Classroom Field Trip (Santa Ana Pueblo)	5/8/18	Middle School students	SWP	48	
Rolling River Presentation-Amy Biehl HS, Garfield MS at Valle de Oro	5/10/18	Middle School students	SWP	32	
Rolling River Presentation-Cielo Azul Elementary - Arroyo Clean Up Field Day	5/18/18	Elementary School students	SWP	87	
Rolling River Presentation-Explora Science Fiesta	5/19/18	Elementary and Middle School students	SWP	400	
Rolling River Presentation-Ace Leadership HS at Valle de Oro	5/22/18	High School students	SWP	34	
TOTAL PEOPLE INVOLVED IN EVENT ACTIVITIES				**26,626**	

AS: Animal Sources
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HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

Exhibit 1
Event Participation 2017-2018

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
2017					
Earth Day Puesta Del Sol Elementary-Enviroscape Demo	4/20/17	Elementary School students	SWP	600	
MS4 permit presentation-Rotary Club in Albuquerque	4/20/17	Adults	SWP	40	
Enviroscape Presentation-Mom's Group at Tijeras Creek Restoration Project	7/11/17	Adults	SWP	20	
Rolling River Presentation-Isleta Pueblo Environmental Fair	7/15/17	All Ages	SWP	50	
Rolling River Presentation-Water Day at Railyards Market	7/16/17	All Ages	SWP	100	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 500 Balloon Fiesta Pkwy NE area	8/19/17	Adults	HHW	401	Collected, segregated, packaged, labeled, transported and disposed of 26,218 pounds of Household Hazardous Waste, and 3,600 pounds of Non-Regulated Solid Waste (an average of 74.35 pounds of waste per customer).
Enviroscape Presentation-East Mountain Celebration (with TCRP tours)	9/24/17	All Ages	SWP	50	
Rolling River Presentation-Valle de Oro 5th Birthday	9/30/17	All Ages	SWP	125	
Corrales Harvest Fest	9/30/17	All Ages	SWP,	10,000	
Rolling River Presentation-RMYC at TCRP	10/2/17	All Ages	SWP	125	
Rolling River Presentation-RMYC at TCRP	10/3/17	All Ages	SWP		
Rolling River Presentation-John Adams and Jimmy Carter MS at Valle de Oro	10/6/17	Middle School students	SWP	33	
Rolling River Presentation-Atrisco Academy HS, Ernie Pyle MS at Valle de Oro	10/9/17	Middle School students	SWP	50	
Rolling River Presentation-Van Buren HS at Valle de Oro	10/11/17	High School students	SWP	39	
Rolling River Presentation-TCRP field trip tour - Carlito Springs	10/19/17	All Ages	SWP		
Rolling River Presentation-Rio Rancho Children's Water Festival	10/23/17	Fourth grade students	SWP	75	
Rio Rancho Children's Water Festival	10/23-24/2017	Elementary Students and Teachers	SWP	1,672	
Enviroscape Presentation-TCRP field trip tour - Carlito Springs	10/25/17	All Ages	SWP		
Animal Humane's Doggie Dash and Dawdle	10/31/17	All Ages	AS, PW, SWP	4,000	Animal Humane's signature event and largest fundraiser
Rolling River Presentation-RMYC at TCRP	11/13/17	All Ages	SWP		
UNM Water Student Group	11/30/17	College Students	SWP	35	

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NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RiverXChange, Georgia O'Keefe	12/14/17	Students, Adults	SWP	52	75 Shrubs Planted
2018					
RiverXChange, Vista Elem.	1/11/18	Students, Adults	SWP	66	78 Shrubs Planted
Holy Ghost	1/18/18	Students, Adults	SWP	47	42 Shrubs, 10 cottonwood Planted
RiverXChange, Monte Vista	1/25/18	Students, Adults	SWP	31	14 Cottonwood Planted
RiverXChange, Bern Co/ O'Keefe	1/26/18	Students, Adults	SWP	59	29 Cottonwood Planted
Assisted MRGCD with planting	1/27/18	Youth, Adults	SWP	184	Cottonwood, Coyote Willow and Goodings Willow Planted
MRGCD/Fish & Wildlife at Glass Gardens	1/27/18	All Ages	SWP	184	110 Plants and caging
KOB Health and Wellness Fair at EXPO NM	1/27/18-1/28/2018	All Ages	HHW, PW, SWP	8,000	Annual event focusing on wellness; handed out giveaways,surveys
Nahalat Jewish Congregation	1/28/18	Adult		1	8 Cottonwood Planted
Rolling River Presentation-Jefferson Middle School - Science Night	1/29/18	Middle School students	SWP		
GIOS Hubert Humphrey Elem. 4th grade	2/2/18	Students, Adults	SWP	26	20 Cotton Planted
Former Peace Corps	2/3/18	Youth, Adults	SWP	83	100 Cottonwood, 30 Shrubs Planted
RiverXChange, Colinas del Norte	2/6/18	Students, Adults	SWP	57	23 Cottonwood Planted
RiverXChange, Martin Luther King	2/8/18	Students, Adults	SWP	56	40 Cottonwood Planted
RiverXChange, John Baker	2/9/18	Students, Adults	SWP	53	48 Cottonwood Planted
Roots and Shoots	2/10/18	Youth, Adults	SWP	15	25 Cottonwood/9 Shrubs Planted
GIOS Helen Cordero School	2/16/18	Children, Adults	SWP	27	45 Twigs Planted
GIOS Explore Academy	2/19/18	Students, Adults	SWP	10	37 Cottonwood Planted
RiverXChange, Sandia Vista	2/20/18	Students, Adults	SWP	32	30 Cottonwood Planted
RiverXChange, NM Connections	2/21/18	Students, Adults	SWP	24	25 Cottonwood Planted
Holy Ghost	2/22/18	Students, Adults	SWP	31	100 Cottonwood Planted
RiverXChange, John Baker	2/23/18	Students, Adults	SWP	63	50 Cottonwood Planted
UNM Pathways	2/24/18	Youth, Adults	SWP	69	105 Cottonwood/30 shrubs Planted
GIOS Inez Elem. 5th grade	2/26/18	65 students/9 adults	SWP	74	45 cottonwood Planted
RiverXChange, Osuna	2/28/18	54 students/8 adults	SWP	62	40 Cottonwood Planted
RiverXChange, Rio Rancho Elem	3/1/18	54 students/7 Adults	SWP	61	40 Cottonwood Planted
Family and Friends	3/1/18	Children, Adults	SWP	10	30 Cottonwood & Black Willow Planted
RiverXChange, Rio Rancho Elem	3/2/18	57 students/9 Adults	SWP	56	33 Cottonwood Planted
RiverXChange, MLK	3/6/18	54 students/9 Adults	SWP	63	39 Cottonwood & Black Willow Planted
Bosque School	3/8/18	17 Students/3 Adults	SWP	20	12 Cottonwood & Black Willow Planted
Bosque School	3/8/18	18 Students/4 Adults	SWP	22	12 Cottonwood & Black Willow Planted
Bosque School	3/9/18	18 Students/4 Adults	SWP	22	13 Cottonwood & Black Willow Planted
Bosque School	3/9/18	18 Students/3 Adults	SWP	21	20 Cottonwood & Black Willow Planted
Sandia Civitans	3/10/18	1 Youth/ 11 Adults	SWP	12	36 Cottonwood & Black Willow Planted
RR Schools	3/10/18	46 Students/6 Adults	SWP	52	22 Cottonwood & Black Willow Planted

AS: Animal Sources
CON: Construction
HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RiverXChange, Rio Rancho Elem	3/13/18	Students, Adults	SWP	31	50 Cottonwood Planted
RiverXChange, MLK	3/20/18	Students, Adults	SWP	58	24 Cottonwood Planted
RiverXChange, Osuna/ Bandelier	3/21/18	Students, Adults	SWP	45	35 Cottonwood Planted
RiverXChange, Colinas del Norte	3/22/18	Students, Adults	SWP	59	26 Cottonwood Planted
RiverXChange, Colinas del Norte	3/23/18	Students, Adults	SWP	31	20 Cottonwood Planted
Rolling River Presentation-Taft and Taylor MS at Valle de Oro	4/6/18	Middle School students	SWP	46	
Rolling River Presentation-UNM Sustainability Expo	4/19/18	College students	SWP	250	
Rolling River Presentation-Earth Day at Annunciation Catholic School	4/20/18	Elementary and Middle School students	SWP		
Rolling River Presentation-Cancer Services of NM Spring Retreat	4/21/18	All Ages	SWP	30	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 6137 Edith Blvd. NE area at	4/21/18	Adults	HHW	415	Collected, segregated, packaged, labeled, transported and disposed of 27,017 pounds of Household Hazardous Waste, and 3,200 pounds of Non-Regulated Solid Waste (an average of 72.81 pounds of waste per customer).
Rolling River Presentation-BEMP Student Congress	4/27/18	High School students	SWP		
Rolling River Presentation-Native Fish in the Classroom Field Trip (Santa Ana Pueblo)	5/8/18	Middle School students	SWP	48	
Rolling River Presentation-Amy Biehl HS, Garfield MS at Valle de Oro	5/10/18	Middle School students	SWP	32	
Rolling River Presentation-Cielo Azul Elementary - Arroyo Clean Up Field Day	5/18/18	Elementary School students	SWP	87	
Rolling River Presentation-Explora Science Fiesta	5/19/18	Elementary and Middle School students	SWP	400	
Rolling River Presentation-Ace Leadership HS at Valle de Oro	5/22/18	High School students	SWP	34	

AS: Animal Sources
CON: Construction
HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

Exhibit 2
ARROYO CLASSROOM 2017-2018

Arroyo Classroom Program

The Arroyo Classroom program utilizes our natural arroyos as outdoor classrooms and brings local animals into the classroom to motivate 3rd graders to respect the arroyos as important wildlife habitat. Orilla Consulting, LLC developed the program in 2012 and initially implemented the program for 7 classes at Maggie Cordova Elementary in Rio Rancho. In 2013, the program grew to serve 20 classes. On July 1st, 2015, Orilla Consulting, LLC transferred the program to Ciudad Soil and Water Conservation District as part of the larger education and outreach efforts we are involved in throughout Bernalillo and Sandoval Counties. In the 2017-2018 school year, we served 33 classes within Rio Rancho Public Schools, reaching approximately 33 teachers and 770 students.

Participating Schools:

- Cielo Azul Elementary (6 classes) *
- Enchanted Hills Elementary (7)
- Maggie Cordova Elementary (6) *
- Martin Luther King, Jr. Elementary (4) *
- Puesta del Sol (6) *
- Sandia Vista Elementary (4)

* Title 1 school

Deliverables to date:
All complete

- Stormwater Presentations: 33:33
- Arroyo Walk: 33:33
- Bat Presentations: 33:33
- Owl Presentations: 33:33

The program consists of a four-part series of lessons, based on grade-level science standards and addressing areas of interest to SSCAFCA, such as bats, burrowing owls, ATV use, pet waste, and arroyo safety. Educator Melissa McLamb delivered two of the lessons – an introductory lesson about watersheds, and a walking field trip to nearby arroyo habitat. Justin Stevenson of RD Wildlife Management, LLC delivered a lesson using live bats. Tavo Cruz of Envirological Services, Inc. delivered presentations with a live Burrowing Owl.

The watershed lesson expounds on the water cycle, already integral in 3rd grade curriculum. This year, we utilized the Enviroscape model to: introduce the concept of a watershed to students, demonstrate stormwater, emphasize arroyo safety and the importance of keeping our arroyos clean.

The arroyo walk is a highlight for students and teachers, as the majority of participating classes only receive one other field trip during the school year, and students always come away learning something new and interesting about the uniqueness of arroyo habitat. This lesson is about the unique adaptations of arroyo animals and plants, incorporates a walk out to a nearby arroyo (when available) and extensive discussion about arroyo safety *(see lesson plan in Appendix A.)* Melissa first talked to students about the difference between concrete-lined channels and sandy-bottomed arroyos, and emphasized that it is never safe to go into concrete-lined channels, while sandy-bottomed arroyos can be visited when there are no clouds in the sky. Students searched for evidence of animals living in the arroyo banks, learned about how lizards, and other cold-blooded animals, are adapted to the desert environment by moving about to regulate their temperature, and looked for certain adaptations of desert plants to minimize water loss in the desert.

In the lesson about bats, Justin discussed common myths about bats while pointing out how these myths can pose issues for bat populations as he addressed each one. He taught students about species common in their area, including what habitat they prefer, what they eat, the challenges they face, and what to do if one sees an injured bat. He talked about how important bats are in keeping insect populations under control, shared ways to encourage and protect bats and emphasized that kids should not be frightened of them, but also should never touch a bat if they find one. Students were able to view two different species of live microbats.

In the owl presentation, Octavio talked with students about what time of year burrowing owls are in our arroyos, what habitat they need, and what we can do to support and protect them. Tavo emphasized the impact of riding ATVs up the sides of arroyos and encouraged ways to care for burrowing owl habitat. He taught students that burrowing owls are protected by federal law, and that 3rd graders could be ambassadors and protectors for the owls. Each student was able to observe the burrowing owl up close, one at a time. We worked in coordination with Wildlife Rescue to bring in the live burrowing owl for each presentation.

Evaluation:

Teachers continue to thank us for offering this program and comment that it is helpful to them in terms of meeting science standards. They mention an increase in student engagement during all of the experiential lessons and find that students are curious and continue to discuss content post presentations. All 33 participating classes, participated in previous years and each school expressed interest in returning next year.

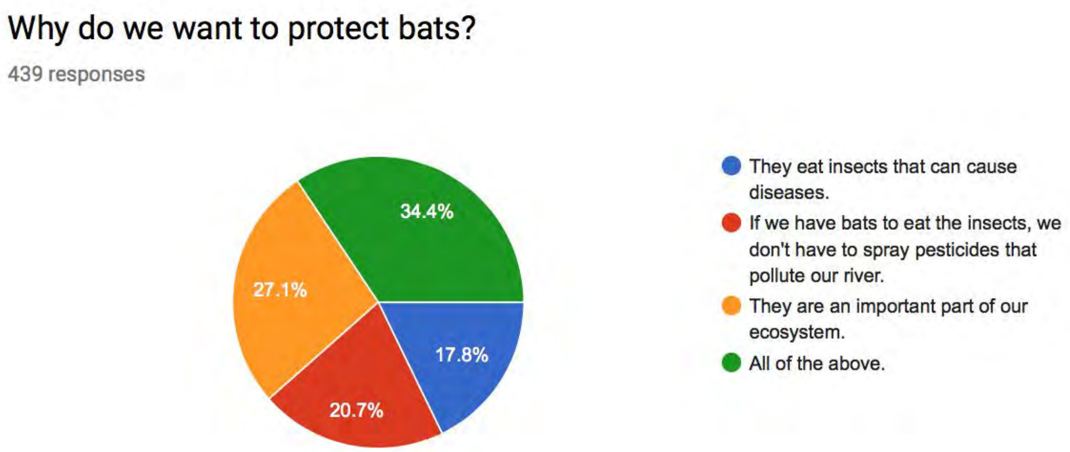
Our two main staff for the program, both resigned from the District in September. This abrupt change resulted in Education Coordinator, Melissa McLamb, taking the lead on the program and spread presentations throughout the entire school year, rather than in the 3-5 month time frame presentations have traditionally been scheduled within. Surveys which have been used in previous years were distributed to assess learning after the owl and bat presentations.

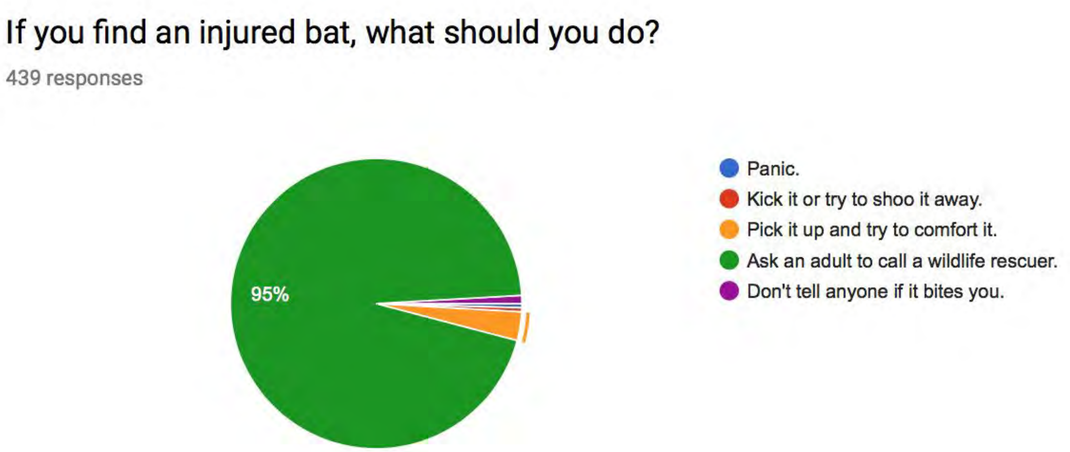
For our second year, we have collaborated with Cielo Azul Elementary for an arroyo clean up event with all of their 3rd grade classes. This year, City of Rio Rancho donated gloves and trash bags as well as provided a dumpster on site at Havasu Park, as part of the Great American CleanUp countrywide initiative. Collectively, students, teachers and other adults picked up 1180 pounds of trash at this event!

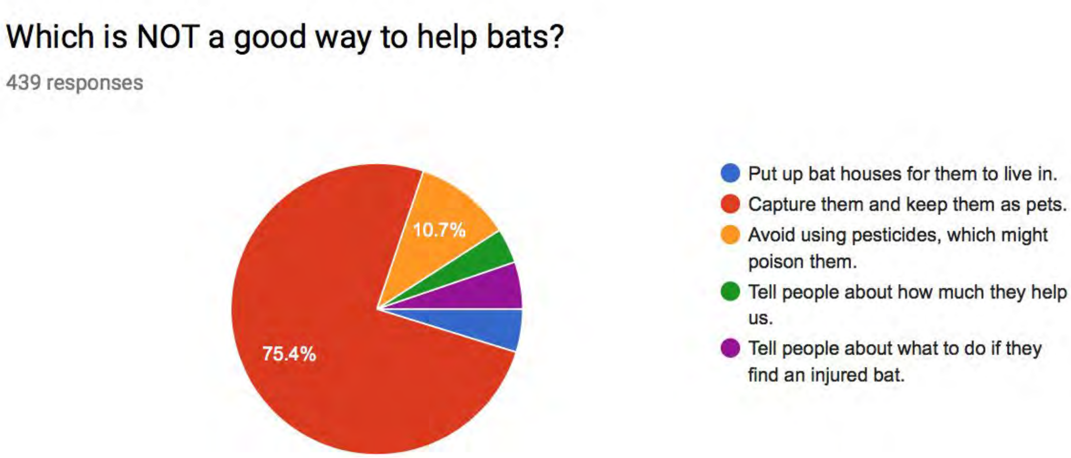
Post-Survey Metrics:

Bat survey

Total responses: 439

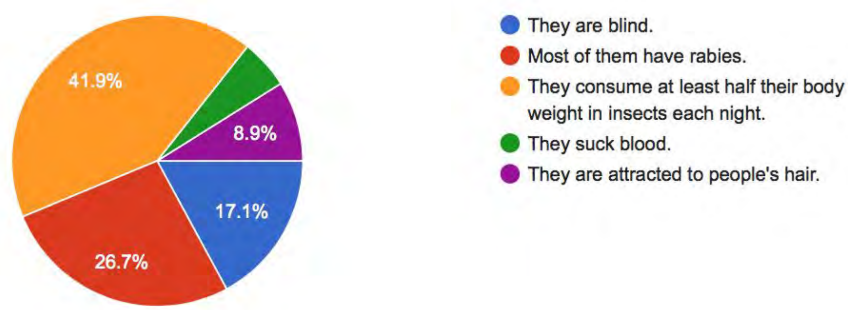






Which of the following is TRUE about the bats that live around Rio Rancho and Corrales?

439 responses

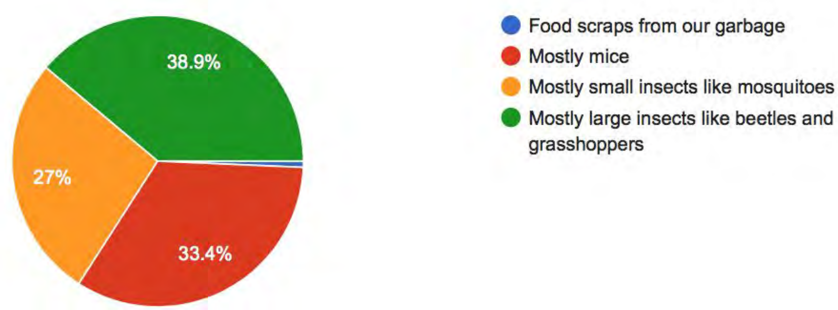


Owl survey

Total responses: 437

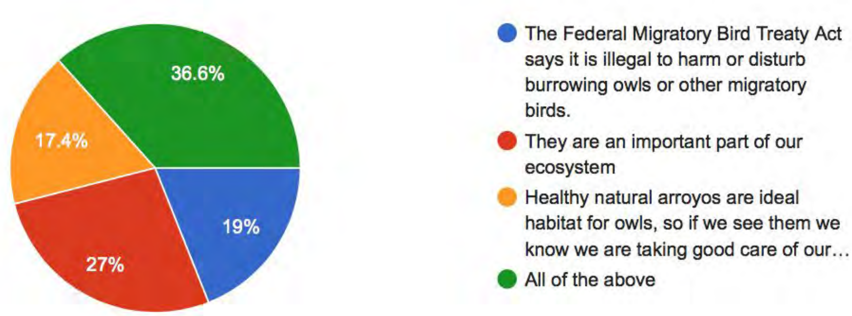
Burrowing owls eat

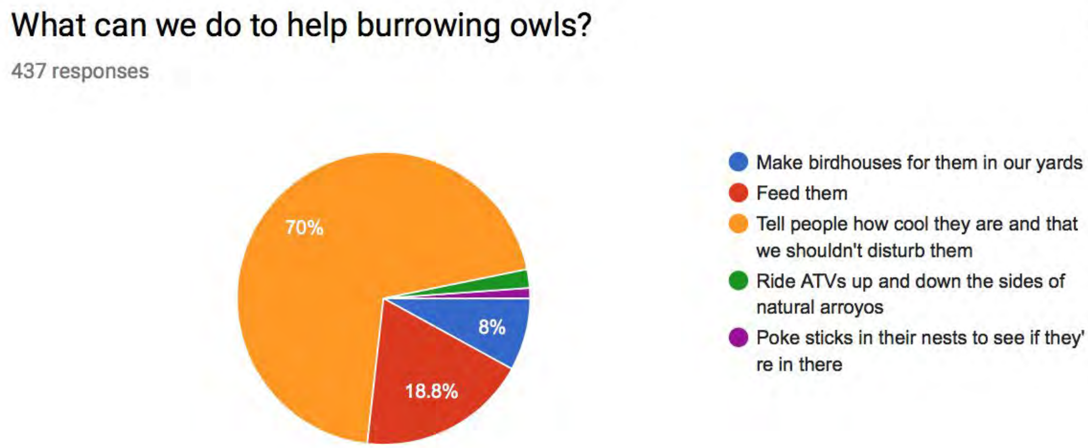
437 responses

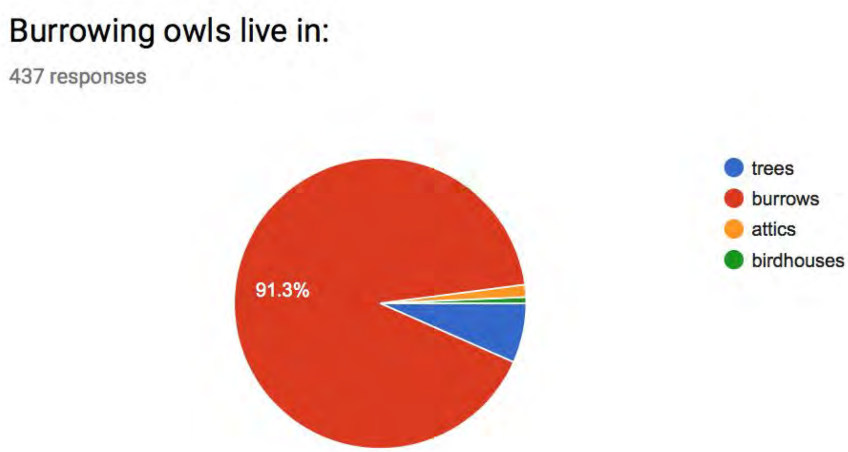


It's important to protect burrowing owls in our arroyos because:

437 responses







Survey Summary: Due to the time constraints and loss of programmatic knowledge created by the change in personnel and lack of training, many surveys were taken months after the bat and/or owl presentation. Surveys were shared with biologists for input. Our educators are noticing that questions with an "all of the above" answers seem difficult to determine for this age group. These surveys will be modified to become one survey in future years of programming, intended to assess comprehensive learning outcomes and distributed twice throughout the program -once before any presentations and once after all presentations are complete. Surveys will be revised to assess main conceptual objectives of each presentation. Surveys have been shared with collaborating biologists to improve questions and learning outcomes in the future.

Appendix A contains lesson plans; Appendix B contains supplemental materials; Appendix C contains photos and in-kind figures from the program.

Appendix A: Lesson Plans

Activity Guide for 3rd Grade – Animal and Plant Adaptations

1. What are we trying to teach the students in this activity?
Arroyos are cool places where animals live, animals and plants are adapted to live in the desert.

2. How can we tie this activity to our teaching goals:

Our Goals	Where we can relate our goals to this activity
Animals live in arroyos	Look for evidence of animals.
We should visit arroyos carefully	Talk about when it is safe.
Picking up dog poop keeps germs out of our river	We'll probably see poop, talk about how it can make animals sick.

Supplies:
- Thermometers
- Clipboards
- Poster of leaf adaptations
- Wax paper
- Paper towels
- Tape

3. How can we tie this activity to standards?
- Measure energy (temperature change)
- Posing a question, using numerical data, various methods to display results
- Animals and plants have adaptations that improve chances of survival
- Classifying animals and plants
- Living things cause changes to their environment, some detrimental, some beneficial

5. How should this activity be organized?

I. Pre-activity (10 minutes)
- Do you ever visit/play in arroyos? What do you do?
- What are arroyos for? Managing stormwater to keep our town from flooding when we get a heavy rain. **Show first flush video.**
- Talk about arroyo safety – don't go into arroyos when you see clouds in the sky.
- Because our arroyos are natural, with sandy sides and bottom, they are safer.
- In Albuquerque, the arroyos have concrete sides and water travels so fast, it is really dangerous to ever go in arroyos. Some arroyos come from the canyon where it might be raining but you can't see.
- Our arroyos are home to all kinds of animals and plants, so they are a wonderful place to enjoy nature. What kinds of animals do you think might live in the arroyo?
- Walk out to arroyo

II. Lizard activity (15 min)

- 5min Look for evidence of animals. What kind of evidence? Scat, tracks, holes.
- What kind of animals live in holes (besides snakes)?
- What do you think makes it difficult to live out here? Heat, sunburn, not much water, cold at night. Animals and plants have special **adaptations** (special things about their bodies) that make it easier for them to live in this habitat.
- How do they get water? From plants, from condensation under rocks.
- How could they avoid heat? Stay in burrows or shade during the day, active at night.
- Some animals love the heat, though! Lizards are cold-blooded, which doesn't mean they are actually cold. It means their body temperature is determined by the environment. They need to absorb heat from their surroundings to function.
- Each student take a thermometer. This is a lizard, and it needs to maintain its body temperature at a certain level: fence lizard 35C (95F), whiptail 38.6C (101F). How can it keep from getting too hot? How can it keep from getting too cold? Lizards regulate their body temperature through behavior.
- Plants do kind of the same thing – hold one palm out flat, one sideways. Which feels hotter? Prickly pear cactus pads grow sideways instead of flat to keep themselves cool!

IV. Plant activity (15 min)
- What do plants need in order to survive? Water, sunlight, air, soil
- What makes it difficult for plants in the desert? It's so hot and there's so little rain.
- How do plants get water? **Show evapotranspiration diagram.** It's kind of like when we're hot, we sweat. But if we lose too much water from sweating we get dehydrated.
- How do they keep cool? Remember prickly pear? **Show pictures of hedgehog and prickly pear cacti.** Desert plants can **s**hade themselves! Hedgehog cactus has lots of spines that shade the surface and also blocks the wind.
- The leaves of many desert plants are **adapted** so that they don't lose too much water.
- Show leaf adaptations poster (fuzzy, small, curled, waxy, green stems but no leaves)

If weather is ok:
- Out in arroyo, we'll do an investigation.
- How many of the plants we see will have these adaptations? Hypothesize.
- To be fair, we can't just pick the plants we like. Standing in one spot, collect the first 6 *different* leaves you see.
- Draw each one, and describe what adaptation it has.
- How many of your 6 leaves have one of the adaptations listed?
- Why don't all have it? Some plants avoid the heat by just growing and producing seed really fast before the weather gets hot, and then they just die off and leave their seeds to grow next year!
- Search for seeds.

If windy, inside activity:
- Let's investigate one way they keep water. **Dab water on board, cover one spot with paper towel, one spot with wax paper.** Which do you think will evaporate faster?
- **Show prickly pear picture.** Make model of prickly pear pad: paper towels with wax paper taped around the outside. **Show cut prickly pear pad.**
- Maybe do experiment: soak wax-covered and non wax-covered leaves in water and time how long they take to dry.

V. Conclusion (10 min)

- Arroyos are for flood control, and we shouldn't play in them when clouds are in the sky.
- But they are cool places where animals and plants live, and we can visit when it's clear weather.
- Animals and plants are adapted to live in the desert climate.
- What we do in arroyos affects the plants, and animals' habitats. Should we ride ATVs up the sides? That's something humans do to change our environment for the worse.
- Picking up dog poop is important because it can make animals sick. Where does the water go when it flows down the arroyo? The Rio Grande! Keeping dog poop out of the river is one way humans can change our environment for the better.
- Walk back to classroom

Leaf Adaptations

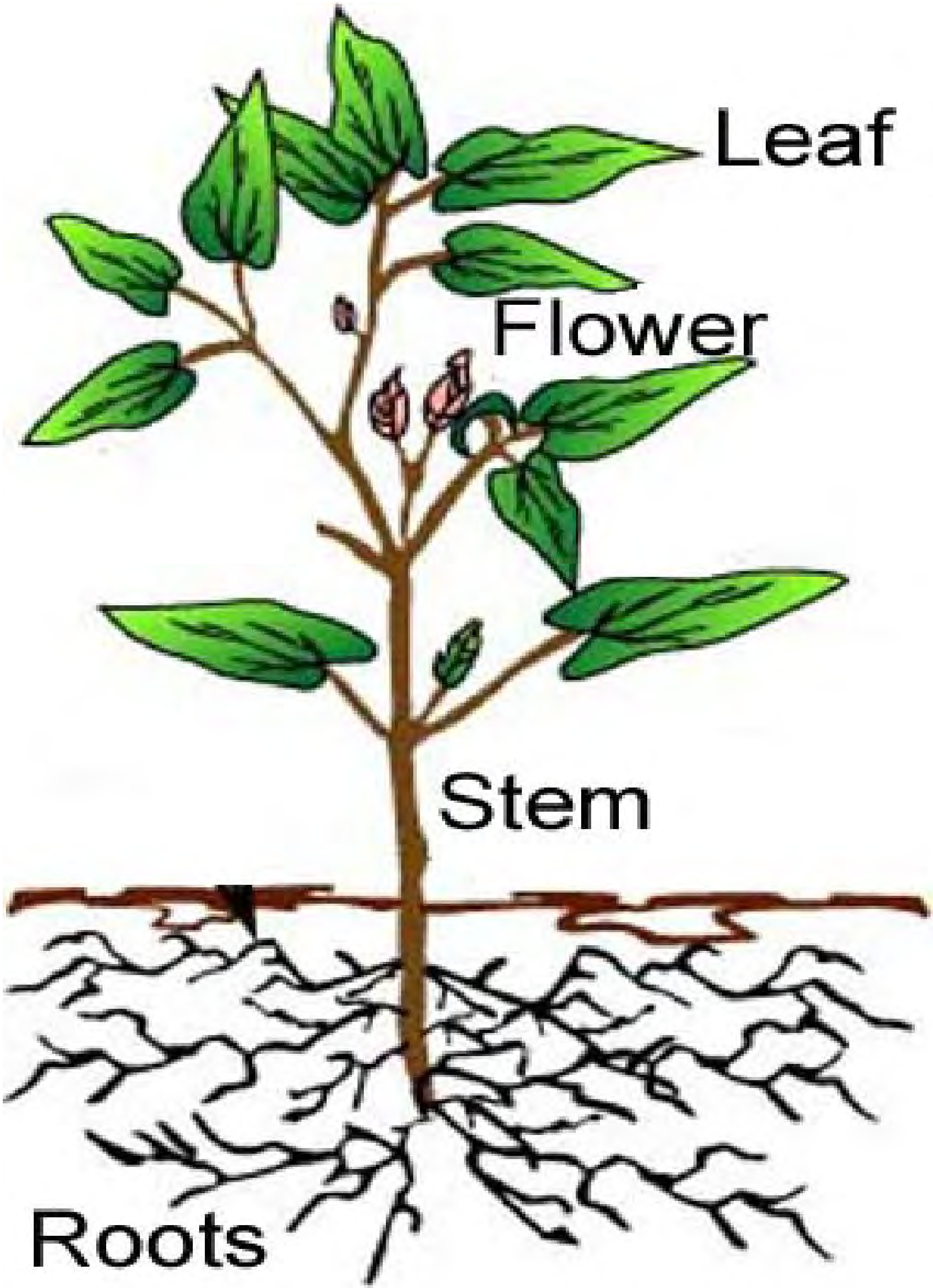
1. Fuzzy leaves or lots of spines

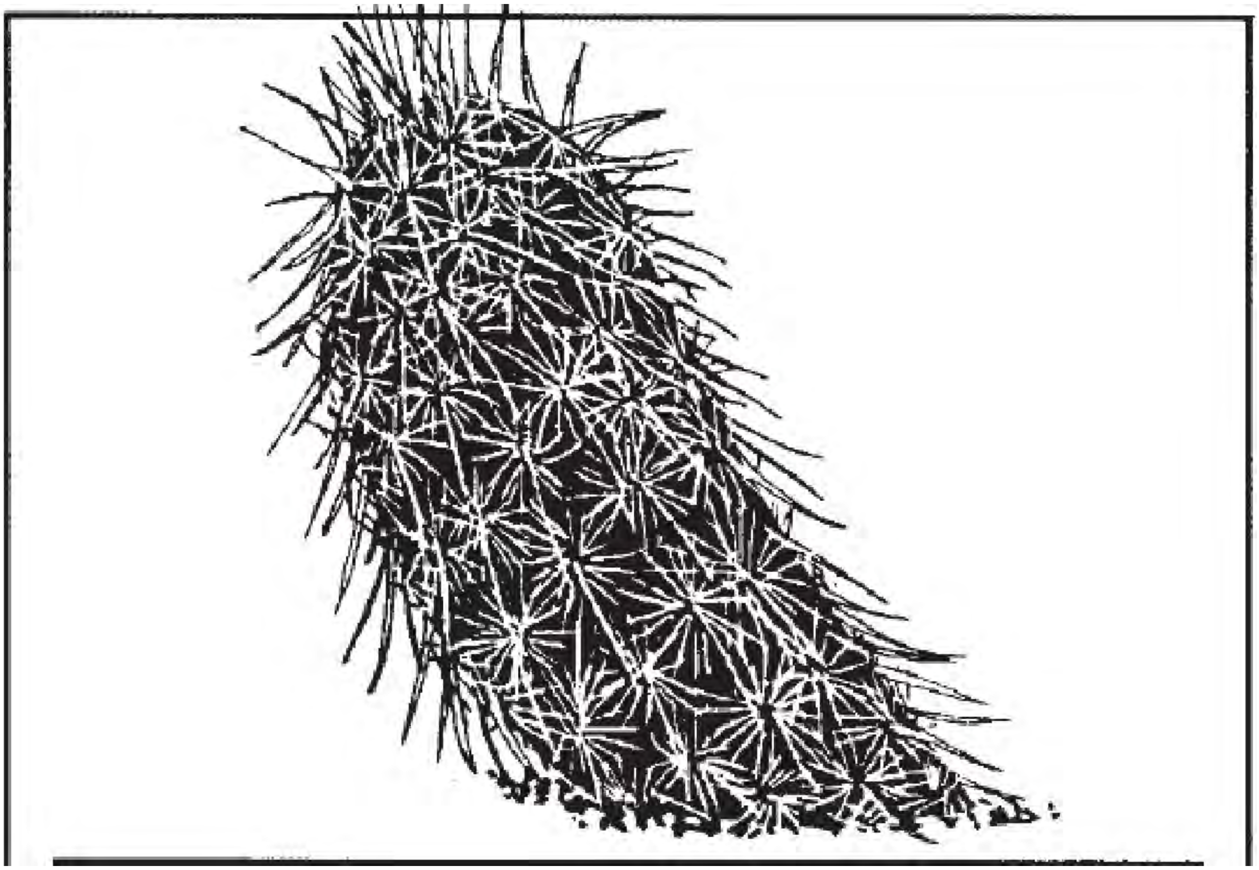
2. Small leaves

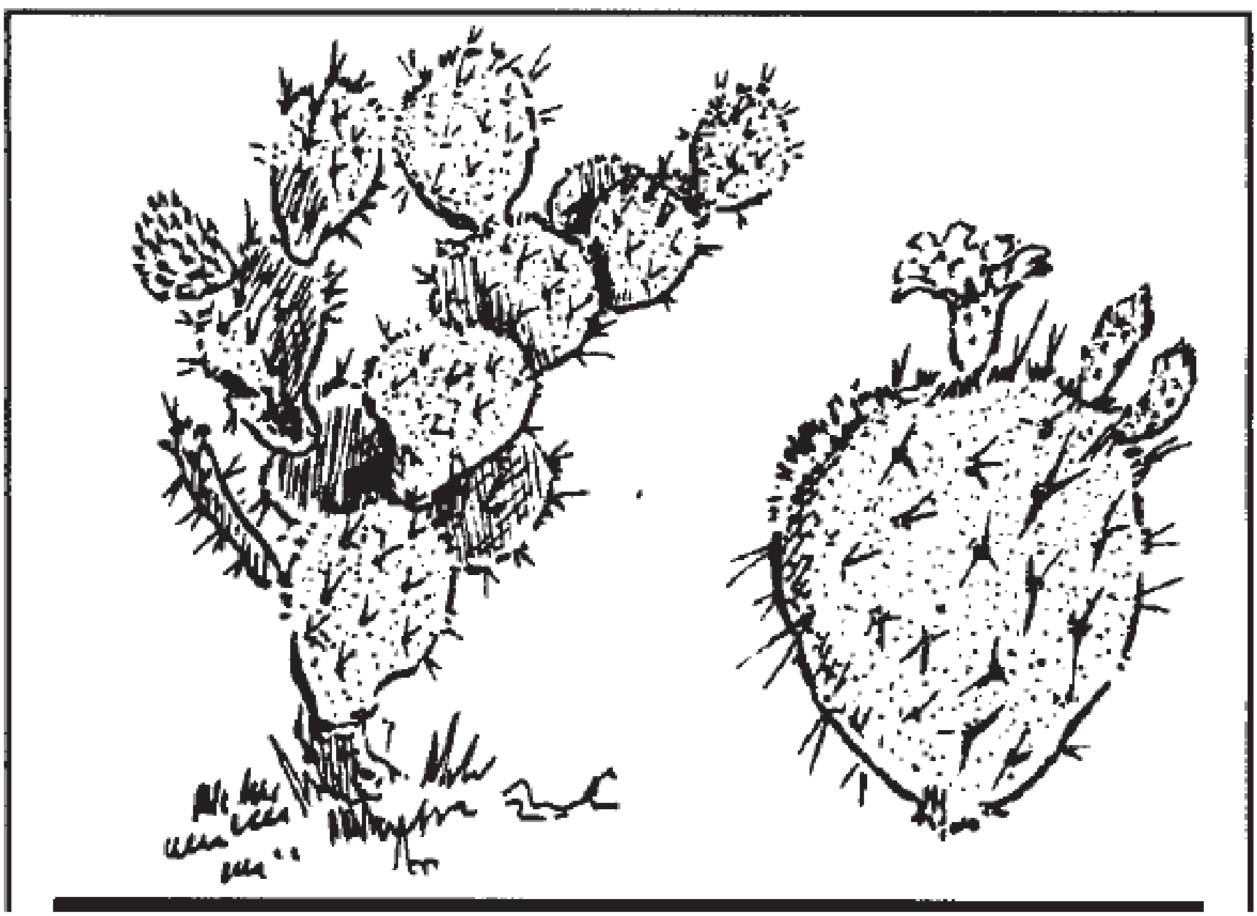
3. Curled leaves

4. Waxy leaves

5. Green stems but no leaves!


Leaf
Flower
Stem
Roots





Enviroscape Activity Guide for Arroyo Classroom

1. What are we trying to teach the students in this activity?
What is a watershed? How does the water cycle work? What are different forms of pollution and how does it impact our river? Arroyos lead to the river and carries different types of pollution with it.

NM State Science Standards:

3rd Grade
Water cycles through the atmosphere, plants, soil, and bodies of water in various forms.
Describe pollution and identify different types (can be naturally occurring or human made materials). Pollutants can get into our water and harm living things.
Some animals can survive better in certain environments, some will not survive at all.
Describe how roots take up water and soil nutrients, and leaves make food from sunlight.

2. How can we tie this activity to our teaching goals:

Our Goals	Where we can relate our goals to this activity
How does the water cycle work?	Describe the processes of the water cycle: evaporation, condensation, precipitation, collection, run-off and infiltration.
What is a watershed?	A watershed is all the land that drains into a river or other body of water, from mountain forests to riparian zone.
What makes water dirty?	Pollution comes from all over the watershed, and erosion is one form of pollution.
Why are arroyos important?	Arroyos provide important drainage in a storm event and provide unique and critical habitat for wildlife and plants.
How does vegetation help our river?	Forests, wetlands and healthy arroyos help keep the river clean and prevent flash floods. Plants in these areas slow the runoff of water into the river, reducing erosion and flooding. They can also remove nasty chemicals from the water by taking them up through their roots.

3. What is effective in this activity? Kids enjoy playing with the model and discussing what they are observing.

4. What makes this activity difficult to teach? Kids want to touch everything on the model and play while you are talking.

Activity Materials and Preparation

- Enviroscape model + toy houses, cars, buildings
- chocolate sprinkles to represent dog poop

- bits of paper and/or rainbow sprinkles to represent trash
- black frosting to represent oil
- sugar sprinkles or food coloring (red or green) to represent pesticides, fertilizer and/or chemicals
- Set up model
- Draw sketch of the water cycle

I. Intro – 5-10 minutes

1. What is the water cycle and how does it work? Reference the water cycle sketch and/or sing the "Water Cycle" song.
2. What is a model and what is its purpose?
3. Introduce Enviroscape as a model of a watershed. What is a watershed?
   -Describe a watershed using the metaphor of a tree (branches as arroyos, trunk as river, leaves as land, roots as ocean)
   -Introduce students to different areas on the watershed.

II. Activity – 20-30 minutes

1. What is pollution? What kind of trash/pollution have you seen in your neighborhood, local arroyo or along the street? As students are identifying different forms of pollution, place the imitation pieces on the model, as you bring their attention to different areas on the model such as residential, roadways, parking lots, farm, etc.
2. Discuss how erosion can be a form of pollution, even though dirt is natural. ***Ask students - can there be too much dirt in the river?***
3. Describe how humans have made changes to the river over the past century, such as straightening the channel, removing wetlands, building houses near it, and creating lots of impermeable surfaces such as parking lots. Note that this means faster flow and more erosion, which can make it hard for native fish to survive. Silvery minnow needs slower flow and more shallow side channels to lay its eggs, sediment can clog up fishes' gills.
4. Talk about how forests play a role in the watershed and can affect the health of a river. **Use watering cans to sprinkle water over the forest and see how it sinks in, not causing much erosion**. ***Ask students why they think this happens.*** Discuss how forests slow the runoff when it rains, because the roots hold the soil in place and take up some of the water.
5. **Farm (sediment, run-off, fertilizer, livestock waste, turbidity as a sand storm, impact on fish)**
6. **Factory (chemicals, waste, management, proximity to arroyo)**
7. **Houses - (dog poop, grease, oil, trash)**
8. **Roads (oil, trash)**
9. Observe the water's path to the river (through arroyos), and erosion below rooflines and at parking lot edges. ***Ask students what they think might be in that runoff. How would you like to drink that if you were a fish?***
10. Notice what happens to water that falls on a hard surface like a street compared to when it falls on a grassy area. Discuss the importance of vegetation. Examine the wetland and discuss how riparian vegetation slows runoff into the river, preventing flooding. **Use the watering cans to sprinkle water directly above the wetland and observe how the wetland traps some of the sediment.**
11. **On the man-made side, use berms to retain hillsides and riverbanks, add buffer strips to parking lots, and construct another wetland.** Discuss with students ways in which they can

protect and support the health of arroyos and the river.

III. Discussion – 10 minutes

- Re-emphasize the concept of a watershed.
- What can we do? Why is it important? Clean up after your dog, utilize trash cans and dispose of waste properly.
- Re-emphasize how arroyos help carry stormwater away from the places where we live, work and play and that they are connected to the river.
- Talk about the importance of keeping our arroyos clean and how to be safe when playing in and around them.

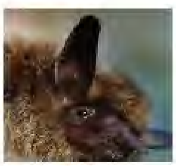
Appendix B: Supplemental Materials

-SSCAFCA Activity Book and Educational Videos:

KNOW YOUR ARROYOS

ENJOY • RESPECT • PROTECT

-SSCAFCA handouts:



Did you know?

SSCAFCA protects our community from flooding and erosion caused by big rain storms, and works to keep stormwater clean. Stormwater flows down arroyos into the Rio Grande.

Bugs like to live in stagnant water that collects in ponds and low places in the arroyos. Insects like mosquitoes can carry diseases that make us sick.

Brought to you by:

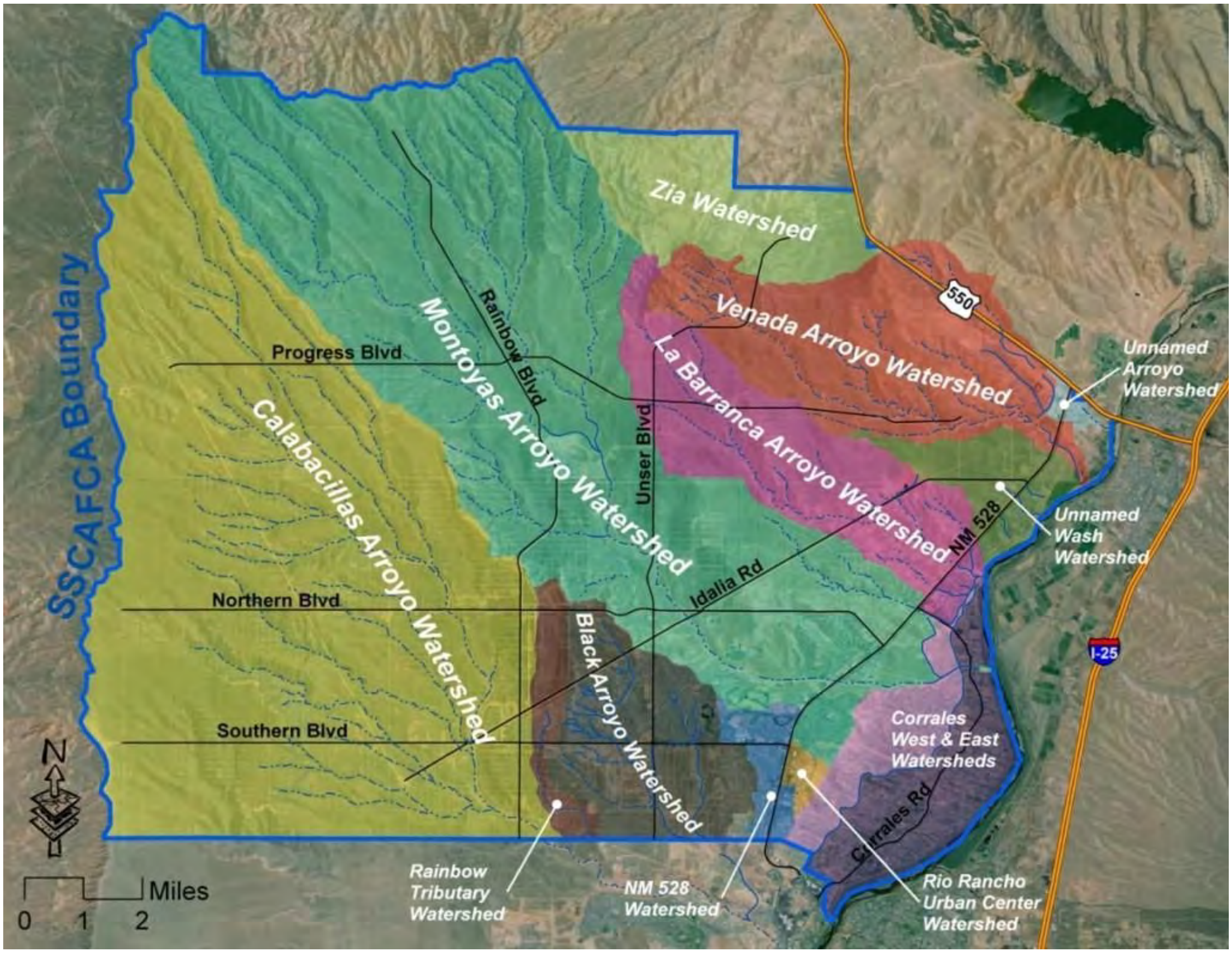
SSCAFCA

Almost all U.S. bats feed exclusively on bugs, and 1 bat can eat between 600 and 1,000 mosquitoes and other insect pests in just one hour. One bat can eat its own weight in insects in a single night!

SSCAFCA provides bat houses to encourage bats to make their homes near our arroyos, and especially near detention ponds where stormwater runoff is captured and allowed to slowly drain.

The more we help bats, the more pests they eat, so we don't have to spray pesticide that could wash down to the Rio Grande and pollute it.

SSCAFCA watershed map:

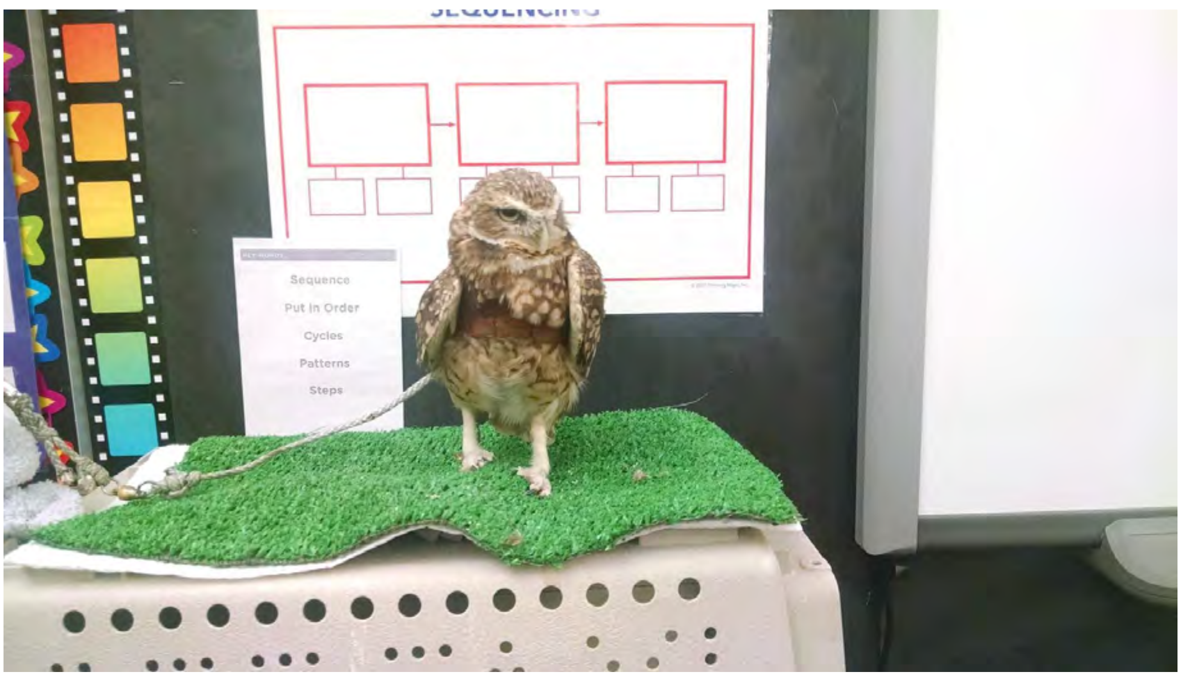


Appendix C: Program Photos

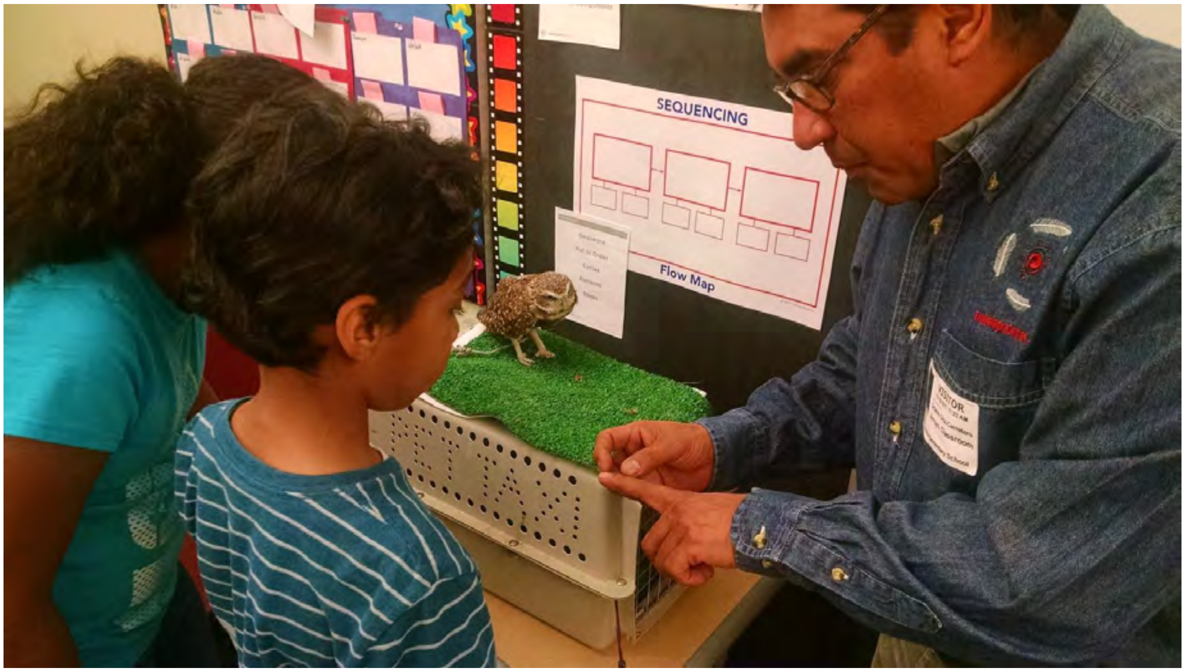
Justin Stevenson showing two microbats in rehabilitation to a class at Maggie Cordova Elementary.

Justin discussing the importance of bats and sharing video footage of their resting behavior.

Teacher at Cielo Azul Elementary disposing of trash picked up in the arroyo on the Arroyo Clean Up Day, May 17th.



Wildlife Rescue, Inc.'s burrowing owl, unable to survive in the wild, now shared for educational purposes.



Octavio Cruz elaborating on unique biological adaptations and answering questions for students at Cielo Azul Elementary.


Students at Enchanted Hills elementary pick up trash on our way back to school from the arroyo walk.

Cielo Azul Arroyo Clean Up Event - May 17, 2018	
City of Rio Rancho - Utilities Dept - coloring books, $2/ea, 150 books	$300.00
City of Rio Rancho - Parks, Rec and Community Services Dept (PRCSD) - Waste Management 40 yd dumpster, including delivery	$275.50
City of RR PRCSD- trash bags, 150, .19/ea	$28.50
City of RR PRCSD- reusable gloves, $.81/pair, 150 pairs	$121.50
88 students, 2 hours of service at $24.14/hr	$4,245.12
13 adults, 2 hours of service at $24.14/hr	$627.64
TOTAL IN-KIND	$5,598.26

Exhibit 3
RiverXchange 2017-2018

Innovative Outreach Program for Upper Elementary Students
Integrating Water Resources Topics with Language Arts & Science

2018 Report

Presented by
Ciudad Soil & Water Conservation District

June 2018

EXECUTIVE SUMMARY

This year, funding enabled 39 NM classes (1,188 students and 42 teachers) to participate. The majority of participating schools were Title I schools. Each NM class was partnered with another NM class and one or more classes outside the state for a total of over 1,412 participants. All program costs and coordination are provided free of charge to NM teachers. Training, technical support, and curriculum materials are provided free of charge to partner teachers. The program required $51,639.06 in cash and generated total match valued at $93,152.09 in the form of in-kind contributions including workshop space, classroom resources, presenters' time in the classroom, field trip docents, donated trees and shrubs as well as the teachers' and students' time.

Ciudad SWCD faced some unexpected challenges during the 2017-2018 school year. The District Coordinator, a main support for our educational programs, resigned unexpectedly in September, leaving a major gap in personnel at the start of school year. We hired on a contractor, Jessica Garduño, in December to assist with programming as needed. This change impacted the RiverXchange process flow as training for Jessica had to occur mid-school year, but we successfully completed the program at participating schools with only three exceptions (see below).

Teachers also continued to face challenges this year with mandatory computer based testing such as the PARCC test, which made it more difficult to access computer labs. We're noticing a pattern of teachers being interested in the blogging concept but having difficulty incorporating it as part of their curriculum throughout the school year.

Despite these challenges, we continue to receive feedback from teachers that they love the presentations and students learn a lot from them. Teachers enjoyed the extension activities and critical question prompts delivered after each one, commenting that it helped them further explore content with their classes. We continued to encourage group participation this school year by setting up reflection groups in each participating class, and distributing critical thinking prompts and follow-up activities to each presentation.

Most of our presenters have worked with us for years and know the program thoroughly, strengthening the correlation between their educational objectives and the goals of the RiverXchange program. We had difficulty scheduling individual presentations for our single participating online classroom and referred them to video presentations as they were available.

Program presentations were completed as follows:

Stormwater: 38/38
Drinking Water: 37/38
Wastewater: 38/38
Agriculture: 37/38
Field Trips: 37/38

We were unable to reschedule one field trip, which was cancelled by a teacher, due to mandatory testing and it being the end of the school year.

This school year, we helped fund an additional field trip for three participating classes in collaboration with US Fish & Wildlife Service. 3 RiverXchange classes also participated in USFWS Native Fish in the Classroom program and RiverXchange was able to fund the buses for their fish release. On these dates, students released approximately 130 native fish to the Middle Rio Grande, including flathead chub, longnose dace, and red shiners.

CONTENTS

PROGRAM DESCRIPTION

Mission

The mission of RiverXchange is to deepen students' and teachers' understanding and appreciation for their local river ecosystem, motivate participants to protect local water resources by conserving water and keeping their source water clean, and to provide a high quality, high impact outreach opportunity for funders and in-kind contributors.

The Big Water Questions

The optional curriculum frames program outcomes as "guiding questions," known as *Big Water Questions*. A long term goal of RiverXchange is that students understand these questions and can formulate logical, fact-based answers by the time they finish elementary school. We believe that students who can synthesize water facts to understand larger water issues will have the proper critical thinking skills and foundation for further discussion in middle and high school so that they will become informed citizens and voters on water issues.

Understanding a Watershed

- Is every place in the world part of a watershed?
- Where does your community's stormwater go?
- How can surface water become polluted?
- How does the water cycle relate to weather?
- How are groundwater and surface water connected?
- How can groundwater become polluted?
- What actions can all of us take to keep water clean?

Water in Our Society

- In what ways does our society use water?
- Where does your community's drinking water come from?
- Does everyone have the right to use as much water as they want?
- Where does your community's wastewater go?
- What actions can all of us take to conserve water?

River Ecosystem

- How does water affect living things in an ecosystem?
- What role do forests play in a watershed?
- What role do wetlands play in a watershed?
- What are some of the ways scientists can determine the health of a river, lake, bay or ocean?
- What actions can all of us take to improve the health of our ecosystem?

Background

As producers of children's water festivals and other grade K12 water resources outreach in NM since 2007, we observed early on that NM elementary teachers rarely incorporated water concepts in the classroom beyond what is required by the state (e.g., water cycle), and that most elementary teachers considered "water" strictly as a science topic. While teachers personally acknowledged the importance of conserving water and keeping source water clean, we continued to find that upper elementary students had little or no understanding of major water resources topics unless the teacher specifically integrates a wide range of water topics into the curriculum. For this reason, as well as our successful festival work with upper elementary students, this age level was selected as the focus for the RiverXchange program.

We created RiverXchange to provide a free program that is fun, interesting, and easy to integrate into the normal curriculum. Our hope was to motivate participants to explore water resources topics in depth. The program is carried out over eight months so that students spend more time developing a sense of pride and personal connection to their own river ecosystem, as well as a personal connection to a distant river ecosystem and the students who live near it.

RiverXchange began in 2007 as a pilot project of Experiential EE, LLC (under a services agreement with the New Mexico Water Conservation Alliance) and the National Great Rivers Research and Education Center, featuring partnerships between two fourth grade classes in Albuquerque, NM, and two fifth grade classes in Godfrey, IL. A curriculum was developed, a field trip to the river was coordinated, and partner classes "met" three times during the year via video tele-conferencing to present what they had learned. The upper elementary level was chosen because of our successful festival work with this age group.

After the pilot project, we transitioned to a web-based technology called a wiki. This enabled us to overcome limitations such as the high cost, availability, and time zone logistical issues associated with video teleconferencing – and easily involve more classes. The curriculum was updated to incorporate the writing component and we introduced classroom guest speakers to reduce teacher workload and bring up-to-date technical information into the classroom.

In 2012, ownership of RiverXchange transferred to Amy White of Orilla Consulting, LLC, who managed the program through July 2015. In August 2015, RiverXchange became part of the Ciudad Soil & Water Conservation District. Since 2007, we have served nearly 17,000 students!

This year, the program featured the following components:

- Optional standards-based curriculum including hands on science and social studies lessons, as well as writing assignments
- Coordination of class partnerships
- KidBlog online posting and communication
- Teacher training on curriculum implementation and use of KidBlog
- Ongoing technical and motivational support
- Online class postings
- End of year teacher survey
- Pre and post student surveys (NM only)
- Payment for teacher workshop substitute teachers (NM only)

- Coordination of at least four guest speakers into the classroom (NM only)
- Coordination of a field trip to the local river or important watershed feature (NM only)
- Field trip bus transportation payment (NM only)
- Field trip leadership and activity planning (NM only)

Program Management and Financial Support

The program timeframe was July 1, 2017 through June 30, 2018. All components including fundraising, design, planning, implementation, and analysis were carried out by employees and contractors of Ciudad Soil & Water Conservation District, including:

Jennifer Moss
Connie Crandall
Melissa McLamb
Jessica Garduño

Sponsors

- Southern Sandoval County Arroyo and Flood Control Authority
- Middle Rio Grande Stormwater Quality Team

Sponsors provided $51,639.06 in cash. Program expenses included:

- Substitute teachers for NM teacher workshops
- Teacher workshop space rental and meals
- Field trip bus transportation for NM classes
- Field trip portable toilet rentals for NM classes
- Technology services
- Office supplies
- Coordination services (planning, implementing and assessing all program components)

New Mexico In-Kind Partners

- Albuquerque Water Utility Authority
- Bernalillo County Cooperative Extension, 4H
- Bernalillo County - Master Naturalist Program
- Bernalillo County - Public Works Division
- Bosque Ecosystem Monitoring Program
- CDM Smith, Inc.
- City of Albuquerque – Open Space Division
- City of Rio Rancho – Environmental Programs Office
- City of Rio Rancho — Parks, Recreation and Community Services Department
- Daniel B. Stephens and Associates
- New Mexico Museum of Natural History and Science
- Sandoval County Cooperative Extension
- Southern Sandoval County Arroyo and Flood Control Authority

In-Kind contributions totaled $93,152.09. For NM classes, in-kind contributions included classroom guest speakers, field trip docents, planting materials, workshop space and computer lab use, classroom resources, and teachers' and students' time attending the presentations and field trips. For partner classes, in-kind contributions were not calculated this year. Sponsors and in-kind partners were recognized on our website and in presentations.

Participant Selection

All 39 participating NM classes were fifth grade classes, distributed as follows:

Bernalillo County	**Sandoval County**
Bandelier Elementary (2 classes)	Colinas del Norte Elementary (5 classes) *
Cochiti Elementary (2 classes) *	Martin Luther King, Jr. Elementary (6 classes)*
Duranes Elementary *	Rio Rancho Elementary School (4 classes) *
Georgia O'Keeffe Elementary (3 classes)	Sandia Vista Elementary (1 class)
John Baker Elementary (4 classes)	Bernalillo Elementary (1 class) *
Monte Vista Elementary (3 classes)	Placitas Elementary (1 class)
Osuna Elementary (3 classes)	
Zia Elementary (1 classes) *	
NM Connections (Online statewide class)	
20 classes, 612 students	**19 classes, 576 students**
* Title 1 school	

All but one partner classes were located in the continental United States, the other was located in South Africa. Partner classes included approximately 308 students and 14 teachers. We have found that partner teachers are highly motivated and come to the program with a willingness to participate even though our NM based funding cannot be used to help coordinate their classroom guest speakers, arrange a field trip, or pay for any direct costs.

Teacher Professional Development Workshop

Although preparation began many months earlier, RiverXchange officially kicked off in October with two teacher workshops for NM teachers and online training sessions for partner teachers. Teachers learned how to implement the activities in the curriculum and how to operate and manage their class blog.

This year, educators from Bosque Ecosystem Monitoring Project gave a professional development talk to RiverXchange teachers, emphasizing ways to incorporate environmental education and citizen science projects into the classroom.

KidBlog Technology

One of the challenging aspects of program implementation continued to be the training of teachers on how to use the KidBlog and encouraging them to do so throughout the year. This was our second year using Reflection Groups for blogging and activities. These groups minimize teachers' time in monitoring posts. To strengthen learning outcomes in the future, educators intend to coordinate presentations over a shorter time frame (3-4 months) and assist classrooms with 1-2 posts throughout the program.

Online Partner Training

Many teachers contacted us if they had technical difficulties and we also checked in with many of them mid Fall to answer any questions and troubleshoot any issues.

Curriculum

A component of RiverXchange is the hands on optional curriculum, which is offered to all participating teachers. It was developed to help students reach for deeper meaning through hands-on learning and reinforce what they have learned through the process of writing to their pen pals. Organizers strive to incorporate emerging water resources issues into the curriculum, increase networking opportunities for teachers, reduce teacher workload, and align the curriculum with public school curriculum priorities.

Each class learns about its own local water resources issues through hands-on activities, classroom guest speakers, and a field trip. Students write about what they are learning via a private educational website that can be viewed by their partner classes. The computer technology and writing components provide a unique opportunity to reinforce what was learned, increase student motivation to learn, and collect valuable metrics about student performance.

Through RiverXchange, students take pride in sharing their knowledge of the local ecosystem and learning from their peers about another river ecosystem. Comparing the two geographical areas gives students a broader understanding of the importance of a river ecosystem to human and other life. Students gain the unique opportunity to share personal experiences and ask questions about a distant place. Teachers feel this kind of personal connection is a big deal for kids – many of whom have never traveled beyond their city limits.

All activities are correlated to NM state standards and benchmarks for Science and Social Studies. All activities (because they require that students communicate information on the KidBlog) address Common Core Language Arts standards for writing. Some activities also address Common Core Mathematics and Science standards. For a summary of the RiverXchange Curriculum, see Appendix 1**.**

Guest Speakers

We coordinated four guest presentations to visit each NM classroom. In all cases, guest speakers were water resources professionals from local agencies. Topics included:

- watershed/nonpoint source pollution

- drinking water
- wastewater
- water and agriculture

Field Trips

The program requires that all classes attend at least one field trip to their local river or important watershed feature, which should incorporate a service learning component if possible. We coordinated all NM field trips. Throughout the winter and spring, students planted over 500 native trees and shrubs and helped restore critical riparian habitat along the Rio Grande in Albuquerque. Several spring field trips included a water quality monitoring component.

<u>New Mexico Field Trip Locations</u>

Gabaldon Trailhead- Open Space

Managed by City of Albuquerque Open Space, this property is located on the east side of the Rio Grande, immediately north of I-40 and Rio Grande Blvd. While students planted native trees, they learned about the history of the Bosque, the significance of invasive species and conservation efforts, and observed porcupines, sandhill cranes, coyotes and other bosque animals.

Tingley Wetland

This 18 acre tract, adjacent to the Bosque in downtown Albuquerque, is owned by the City of Albuquerque, and features a restored constructed pond and peripheral wetlands including native and nonnative aquatic habitat. Students took a hike into the Bosque, observed macroinvertebrates and tested water quality.

<u>Partner Field Trip Locations</u>

Since program funding is NM based, we were not able to assist partner teachers with coordinating a field trip; however, we did provide partner teachers with names of agencies located in most parts of the U.S. that may be able to assist. We know that many of them implement water quality testing. Many also go on field trips to relevant places including water treatment plants, local reservoirs, dams and river/watershed museums.

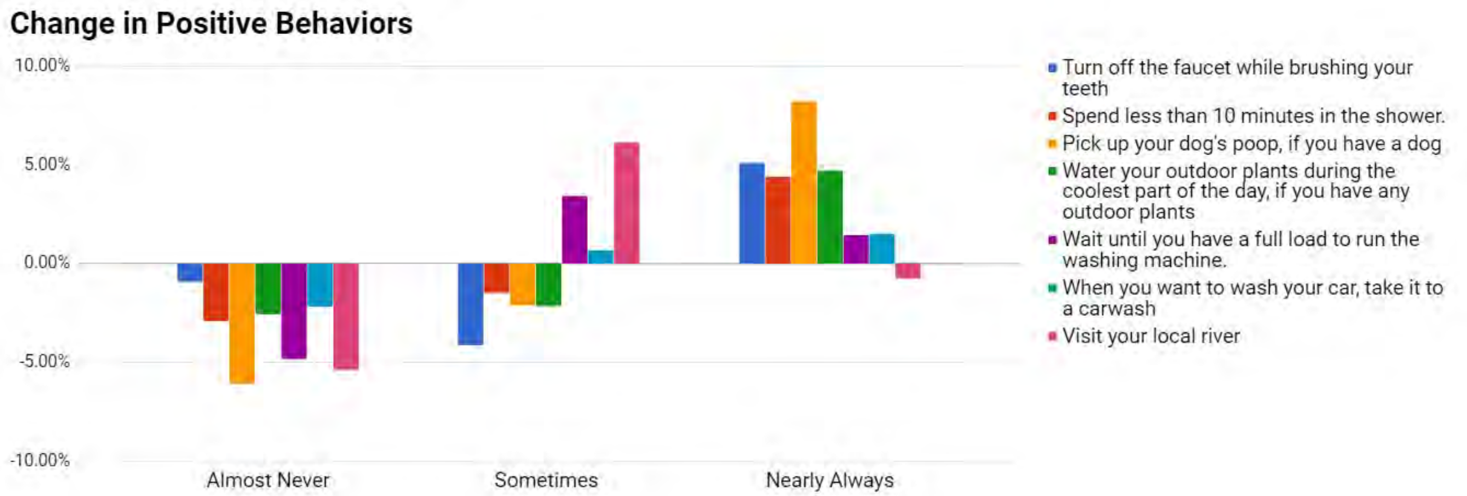
Evaluation

Student Surveys

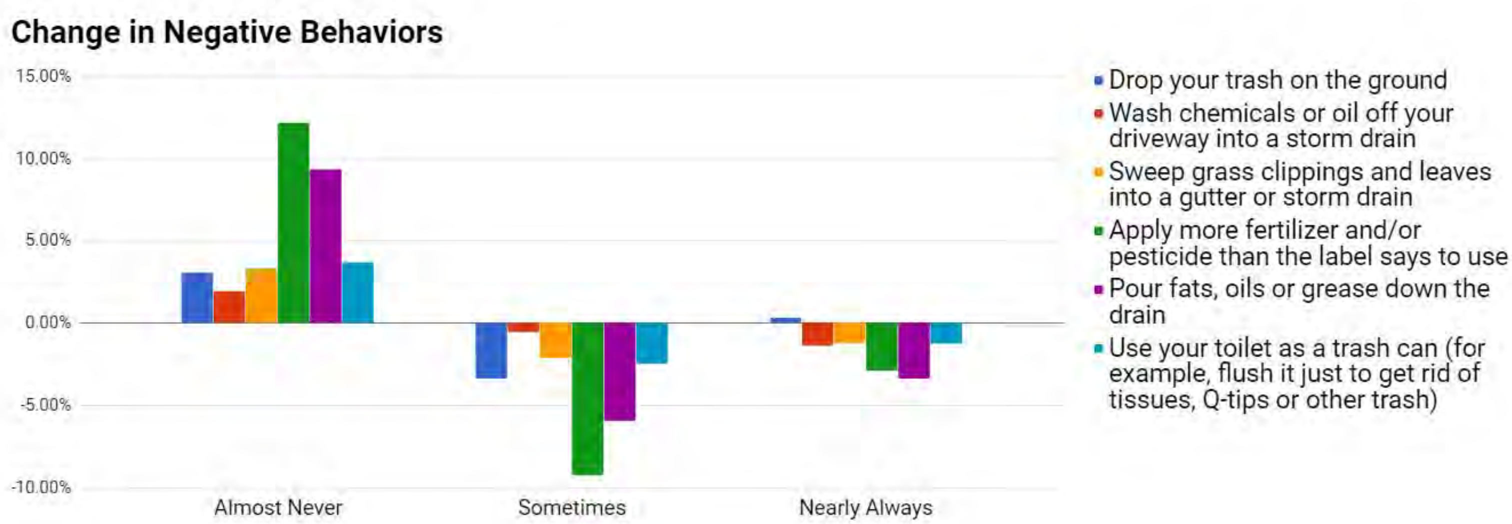
A key component of RiverXchange is its measurable goals relating to student performance. We collected quantitative data on student performance by way of a pre and post survey and qualitative data by reading what students submitted on KidBlog. We also surveyed students about their actions before and after participating in RiverXchange.

<u>Pre/Post Behavior Survey</u>

In order to quantify the learning outcomes achieved through RiverXchange, we ask our teachers to have their students fill out a survey prior to, and upon completion of the program. Below, you will find a series of graphs used to illustrate the change in responses between the pre and post surveys. This year, 812 students completed the pre-survey, while 623 completed the post-survey. In order to account for this discrepancy in participation, the number of each given answer has been calculated as a percent of the total number of responses received for each given survey. We continue to refine the survey and our programming year after year based on teacher feedback and metrics gathered from these surveys.

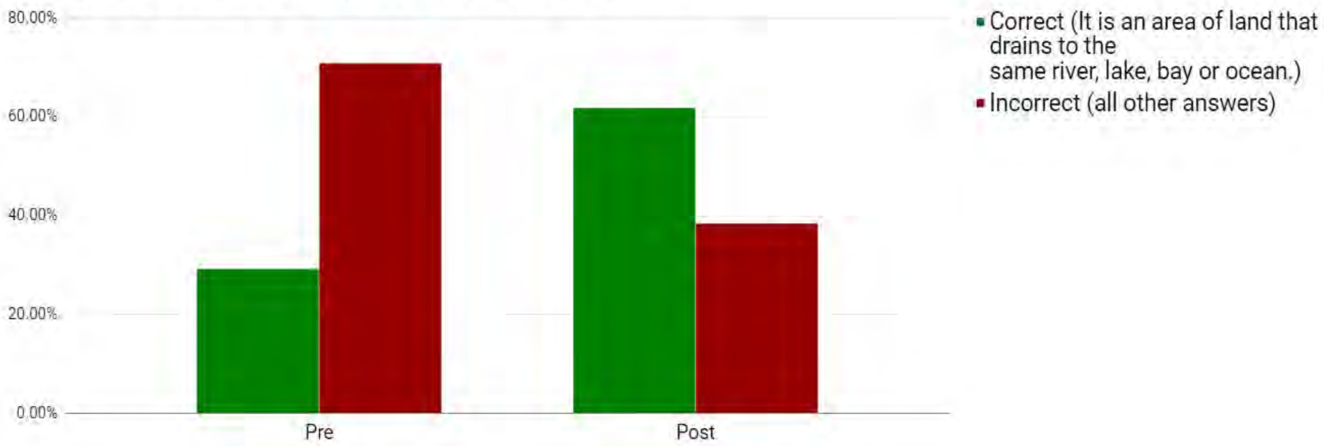


This graph illustrates a significant increase in all the above listed positive behaviors after having received the RiverXchange presentations. For example, the question “How often do you pick up your dog’s poop?” saw a 6.1% decrease in the answer “almost never,” and an 8.21% increase in the answer “nearly always.”

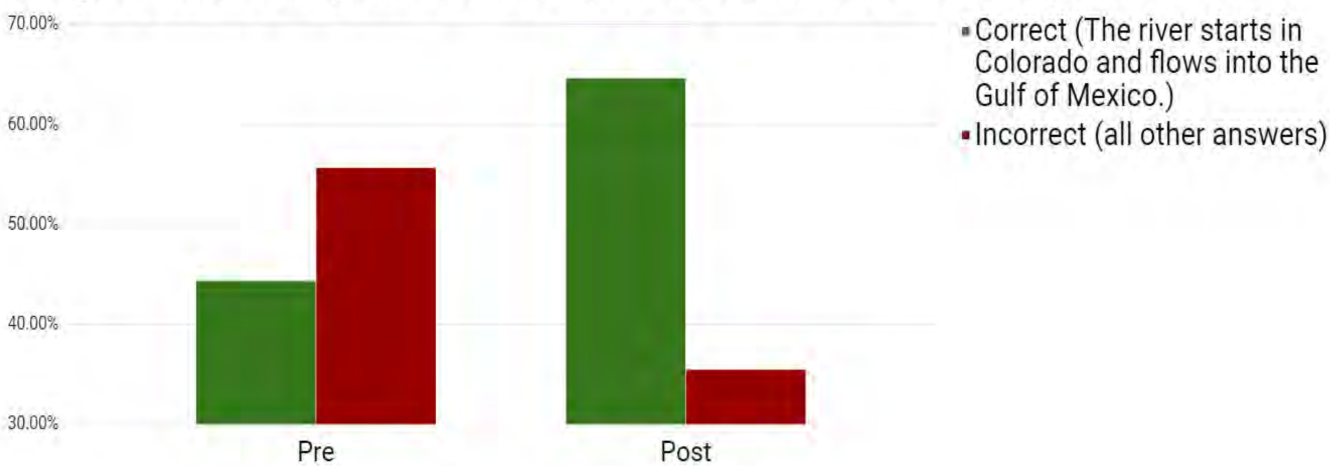


This graph illustrates a significant decrease in all the above listed negative behaviors after having received the RiverXchange presentations. For example, the question “How often do you apply more fertilizer and/or pesticide than the label says to use?” saw a 9.25% decrease in the answer “sometimes,” and an 12.17% increase in the answer “almost never.”

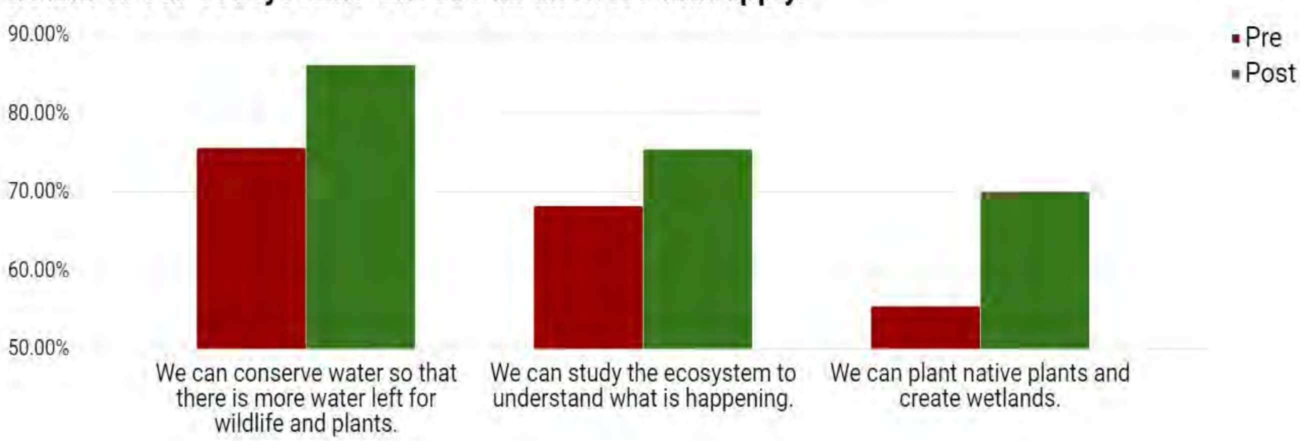
Change in Answer to the question "What is a Watershed?"

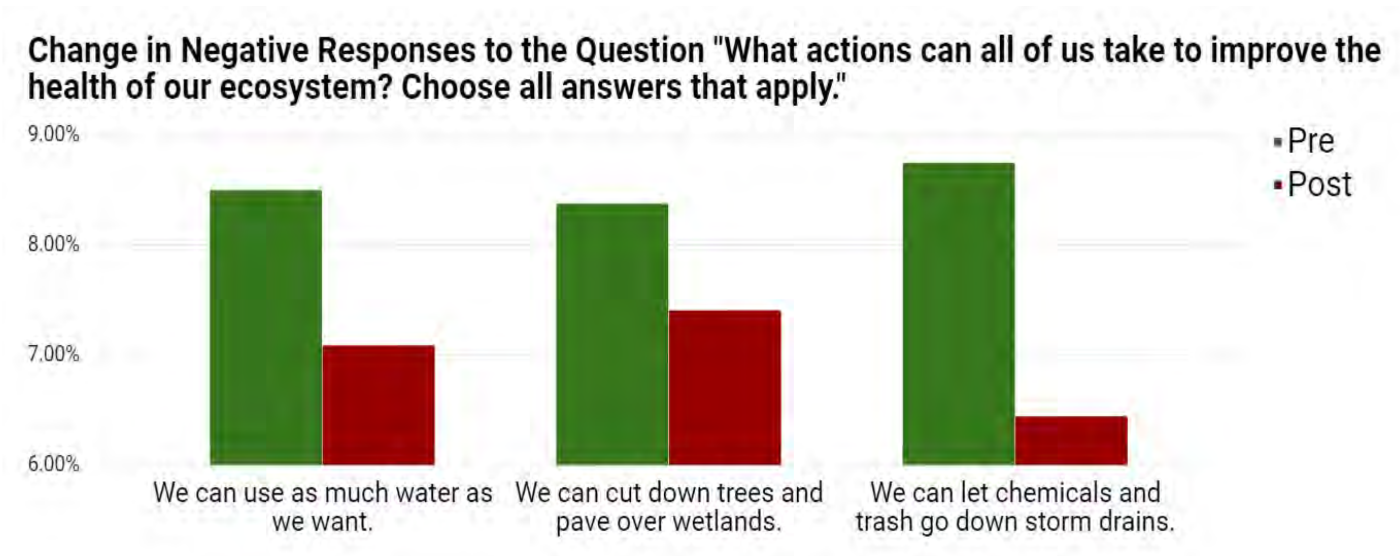


Change in Answer to the Question: "Where does the Rio Grande start and eventually end?"

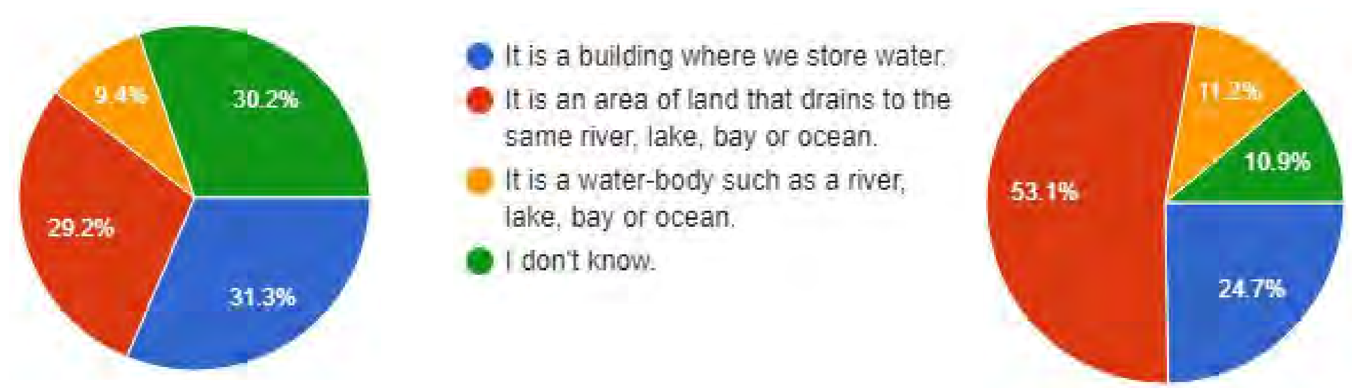


Change in Positive Responses to the Question "What actions can all of us take to improve the health of our ecosystem? Choose all answers that apply."





What is a watershed (also known as a catchment or drainage basin)?

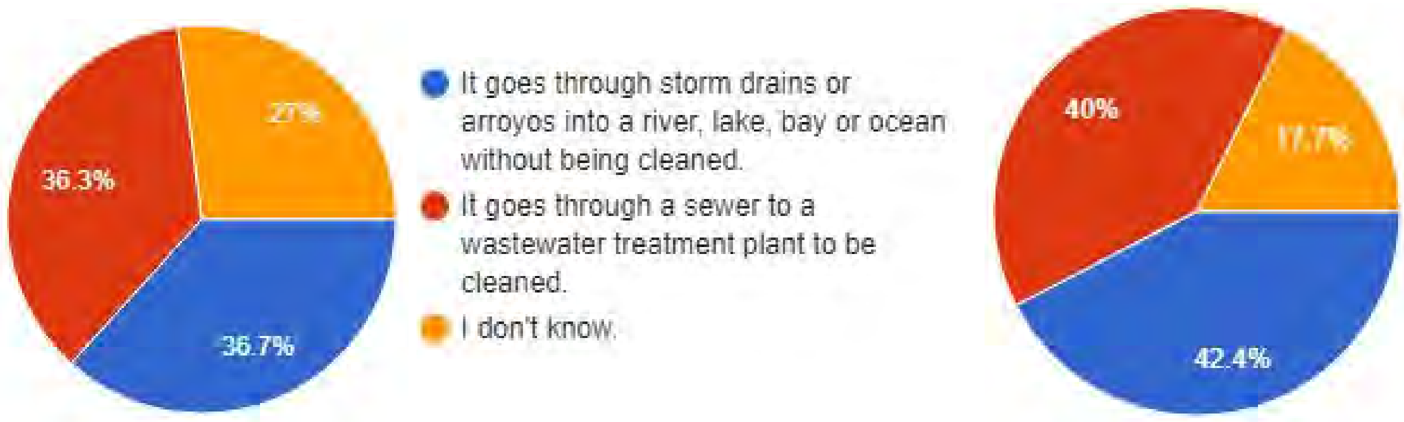


Pre **Post**

How much precipitation does your community receive each year?

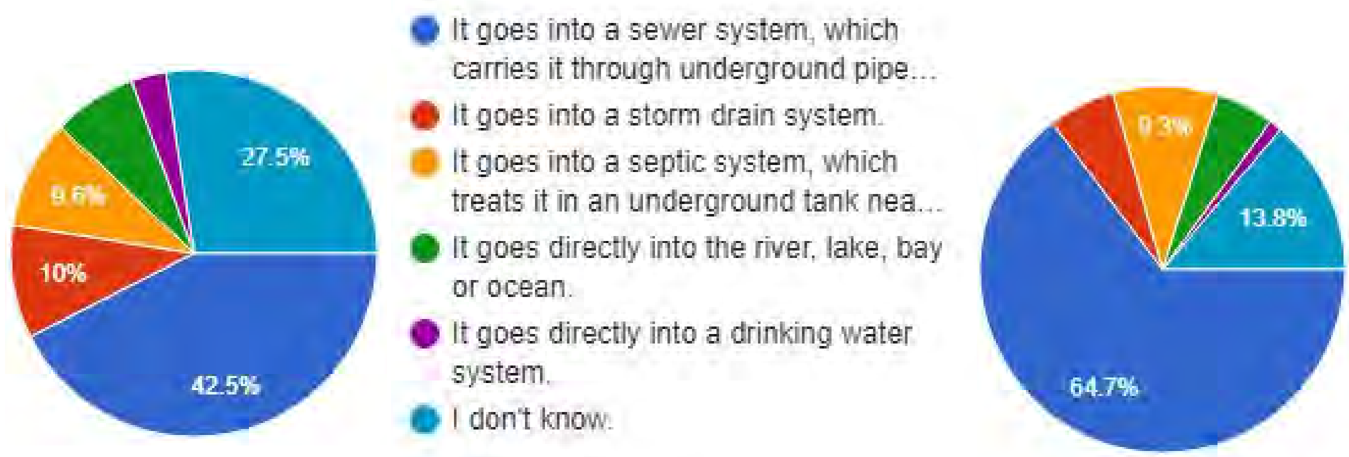
Pre **Post**

When it rains, where does your community's stormwater go?



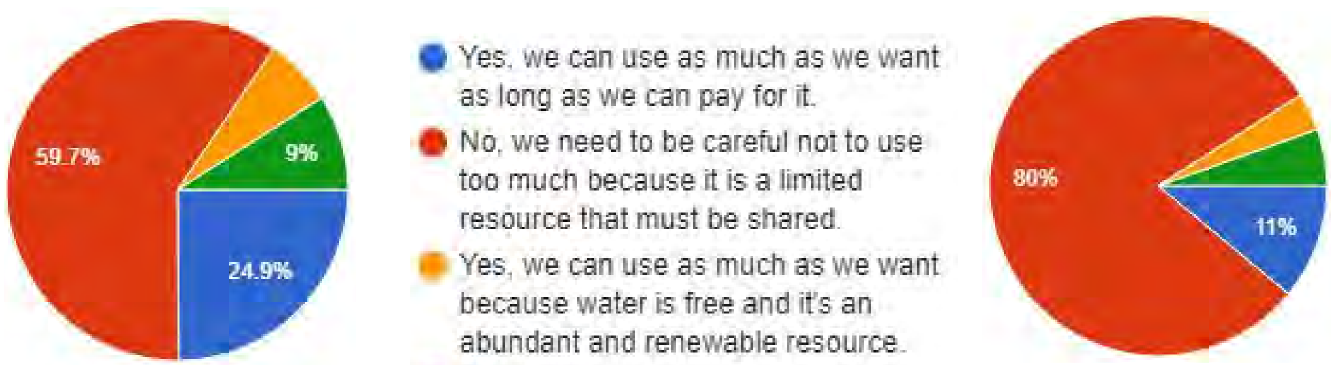
Pre **Post**

Where does your community's wastewater go?

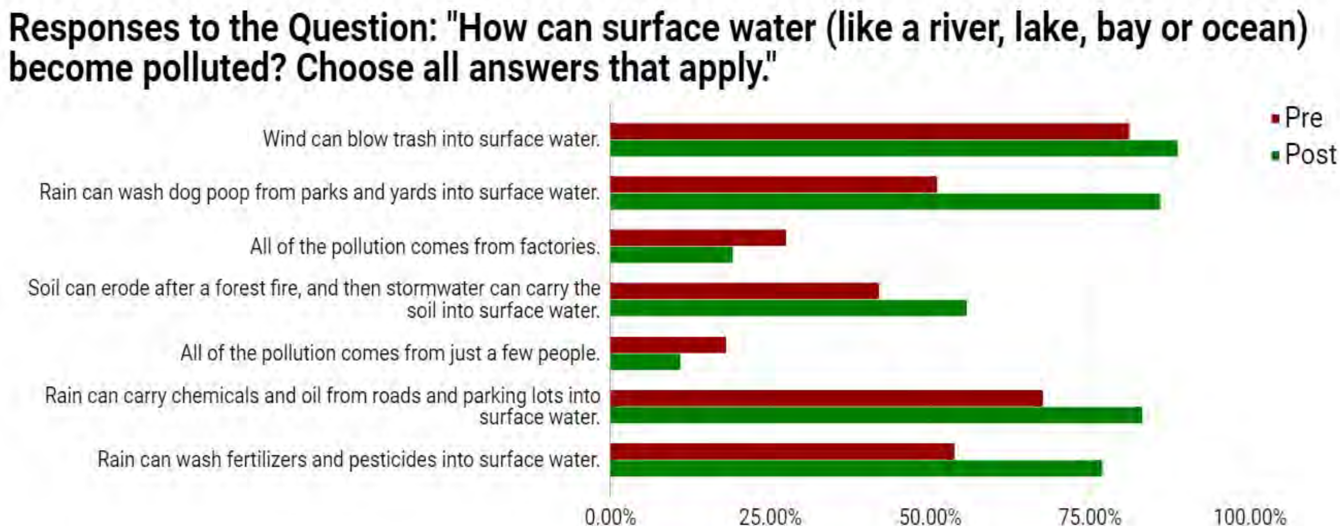


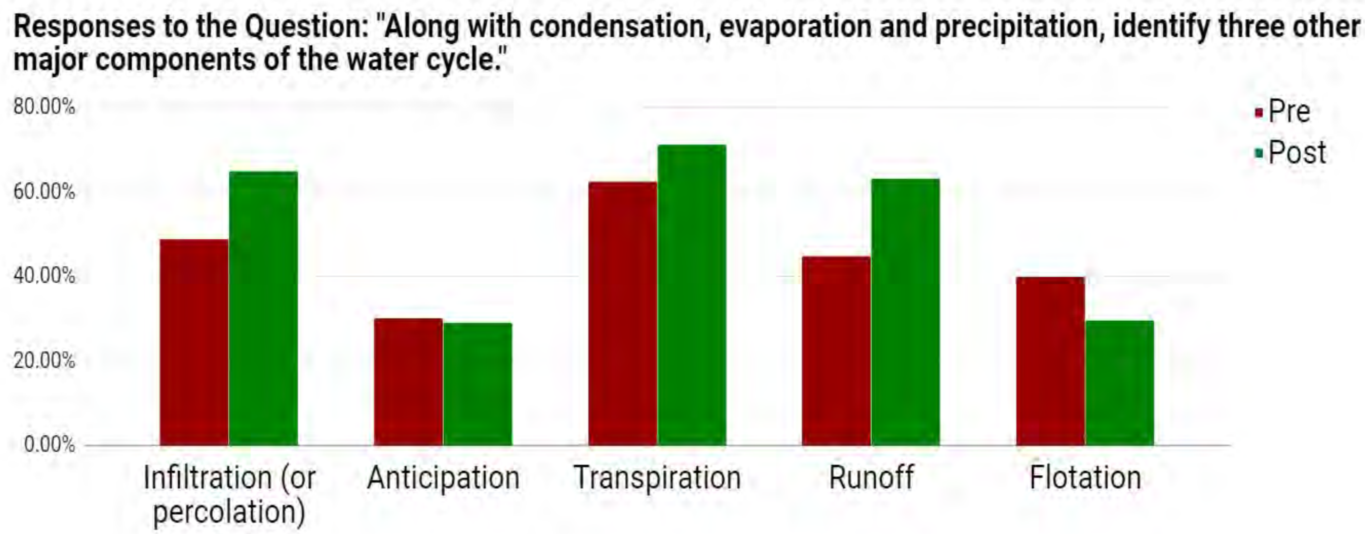
Pre **Post**

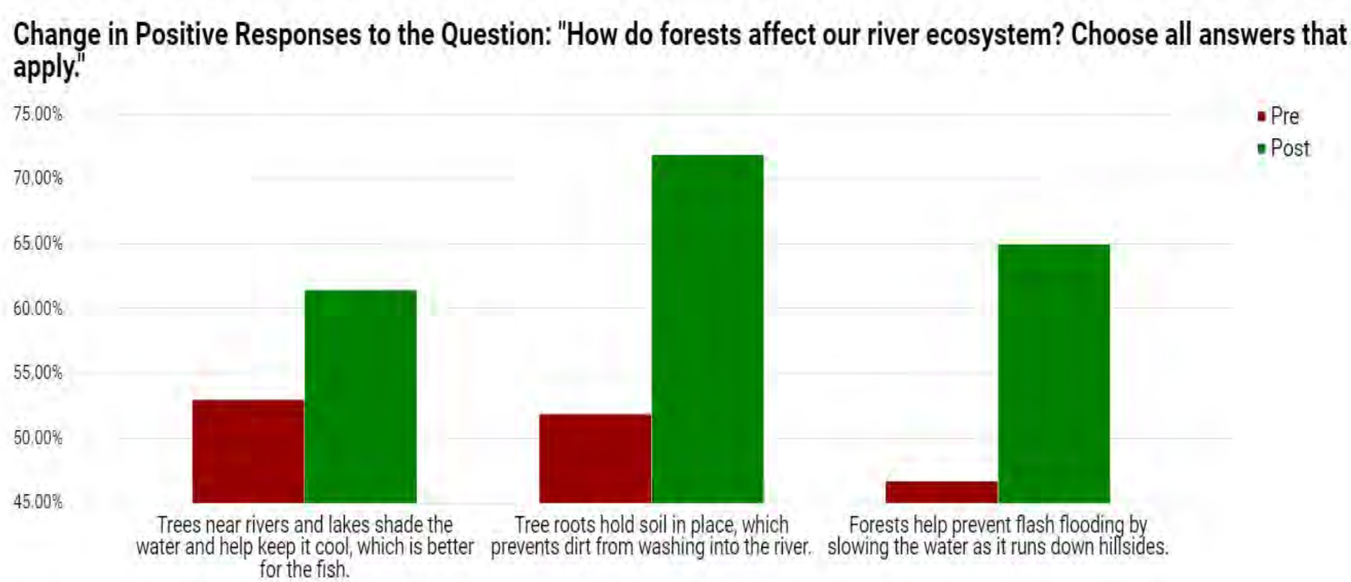
Does everyone have the right to use as much water as they want?

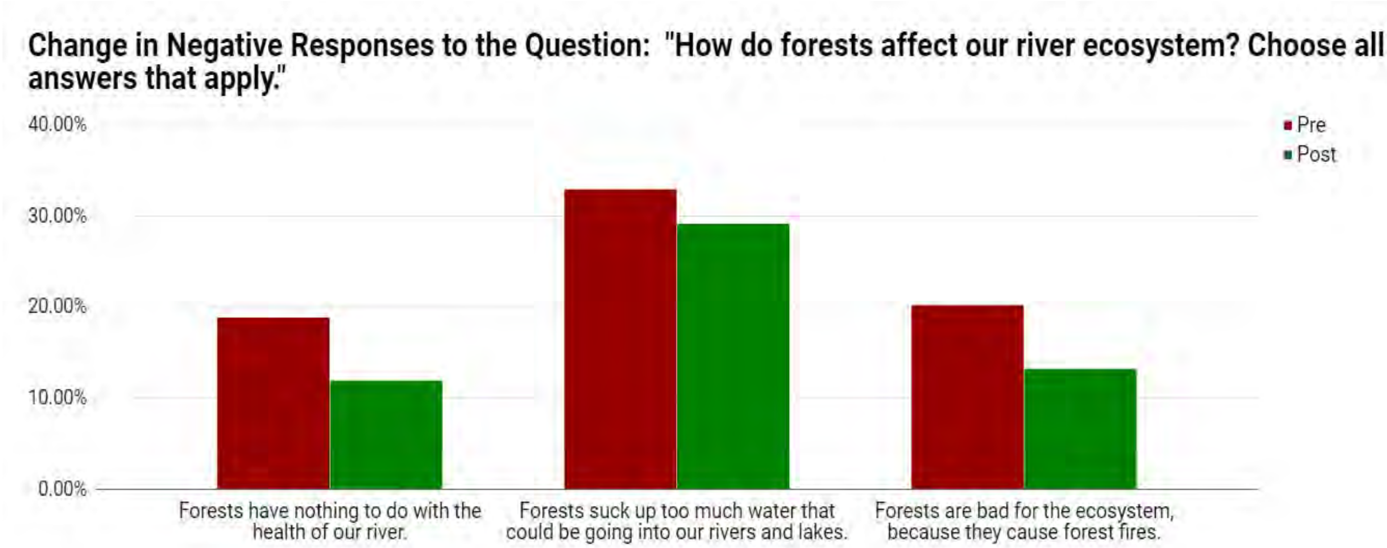


Pre **Post**

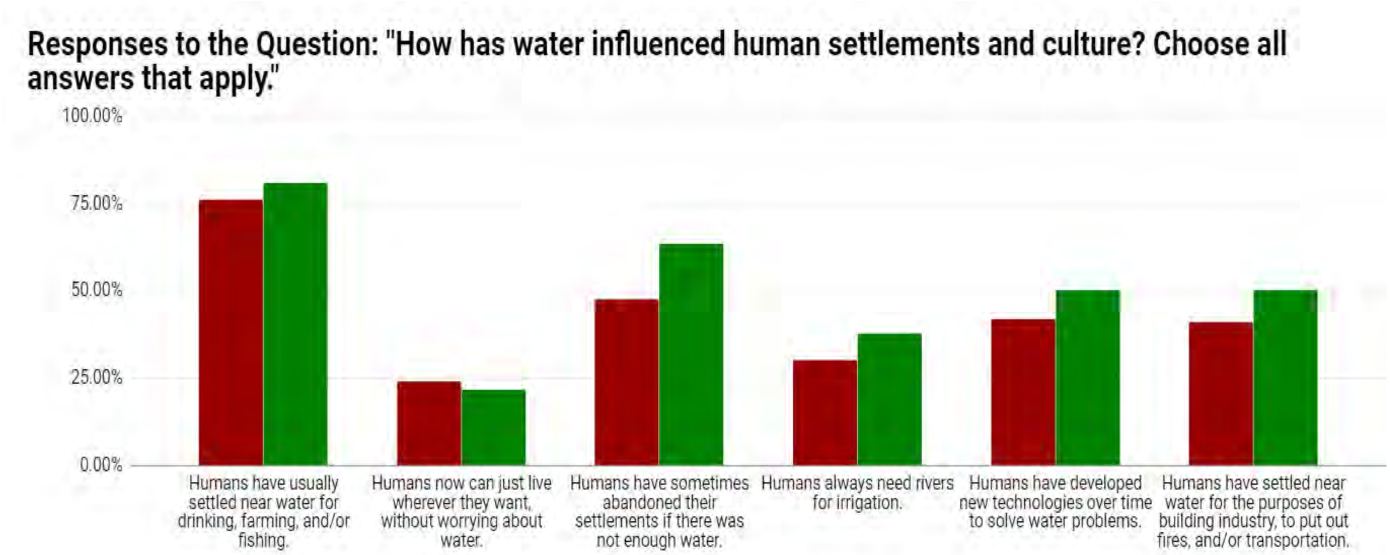

Responses to the Question: "How can surface water (like a river, lake, bay or ocean) become polluted? Choose all answers that apply."
Pre
Post
Wind can blow trash into surface water.
Rain can wash dog poop from parks and yards into surface water.
All of the pollution comes from factories.
Soil can erode after a forest fire, and then stormwater can carry the soil into surface water.
All of the pollution comes from just a few people.
Rain can carry chemicals and oil from roads and parking lots into surface water.
Rain can wash fertilizers and pesticides into surface water.
0.00%
25.00%
50.00%
75.00%
100.00%

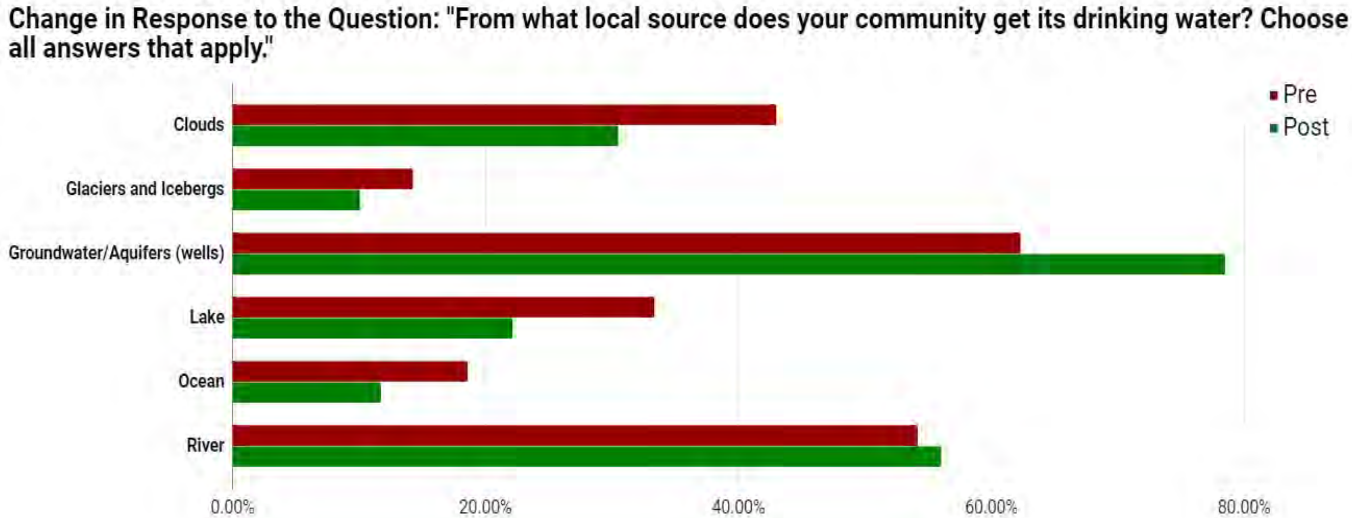

Responses to the Question: "Along with condensation, evaporation and precipitation, identify three other major components of the water cycle."
80.00%
60.00%
40.00%
20.00%
0.00%
Pre
Post
Infiltration (or percolation)
Anticipation
Transpiration
Runoff
Flotation

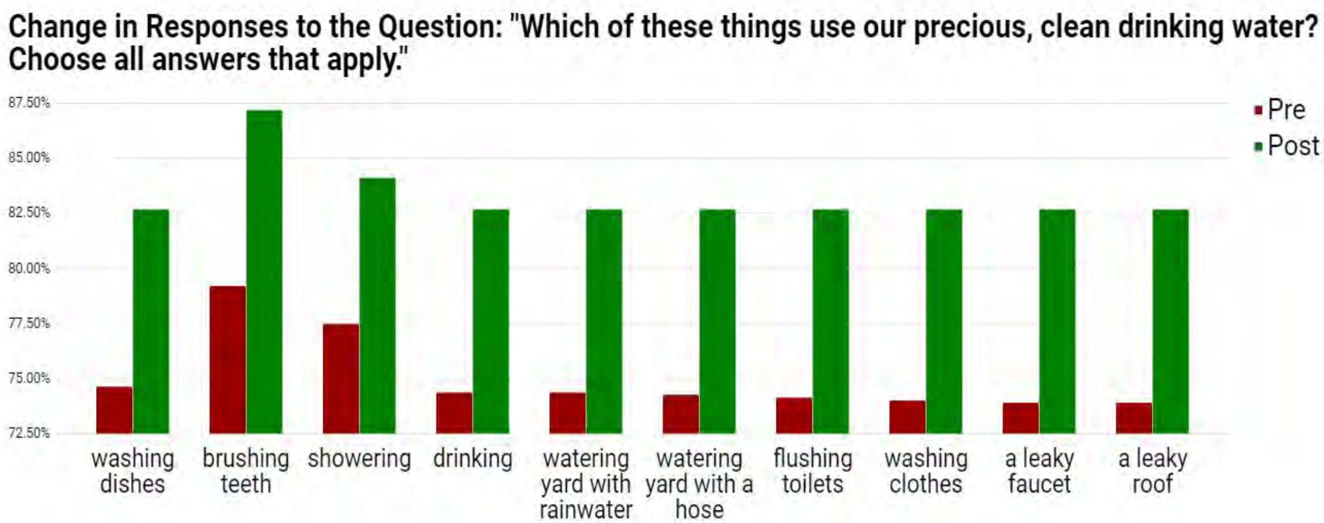

Change in Positive Responses to the Question: "How do forests affect our river ecosystem? Choose all answers that apply."
75.00%
70.00%
65.00%
60.00%
55.00%
50.00%
45.00%
Pre
Post
Trees near rivers and lakes shade the water and help keep it cool, which is better for the fish.
Tree roots hold soil in place, which prevents dirt from washing into the river.
Forests help prevent flash flooding by slowing the water as it runs down hillsides.

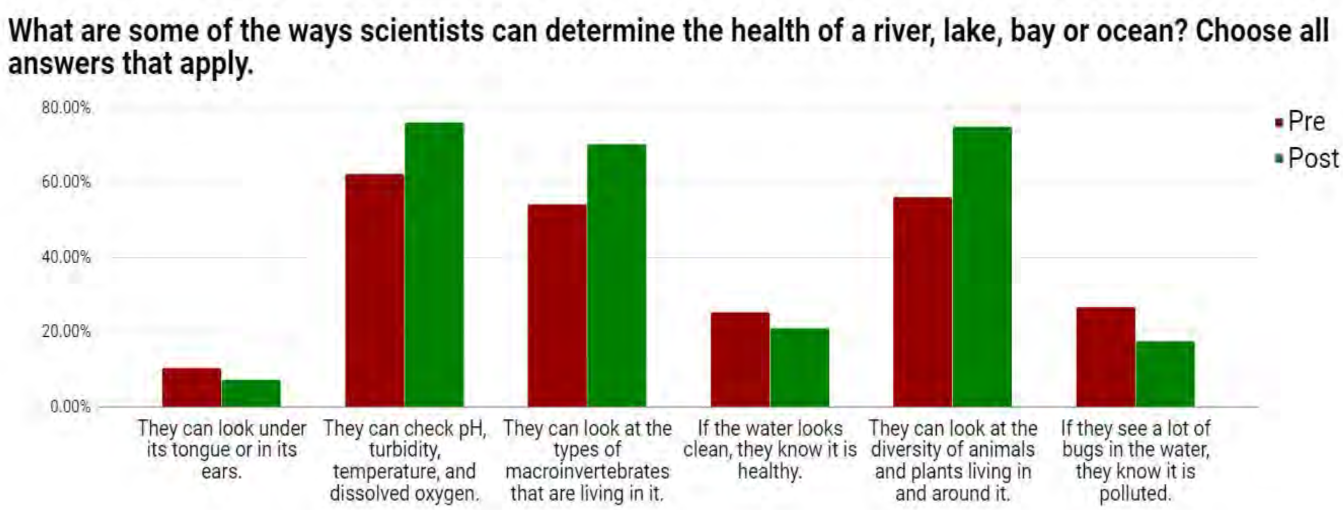


This decrease in negative responses indicates that our students have gained a better understanding of the effects of forests on our river ecosystem after participating in RiverXchange.

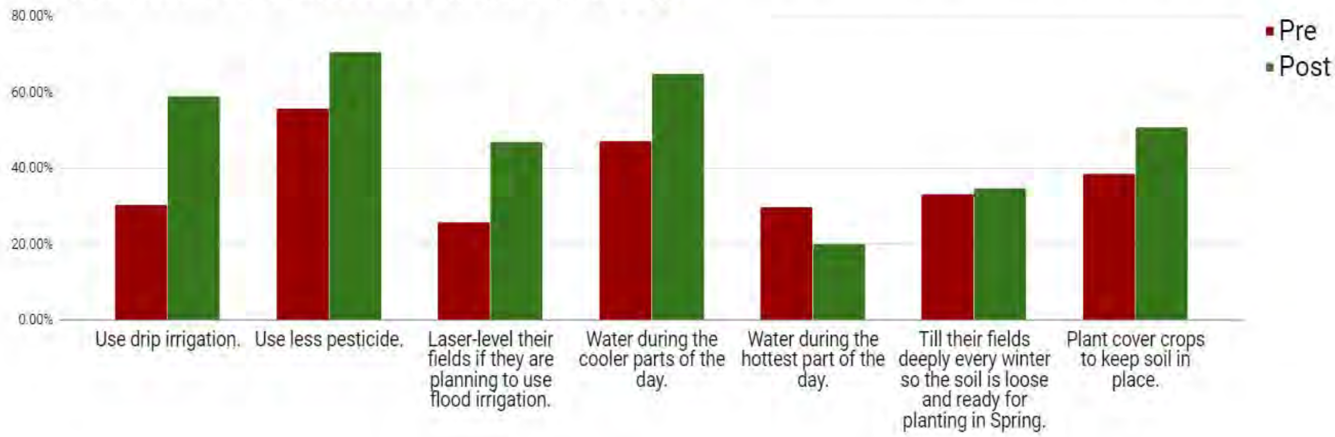



Change in Response to the Question: "From what local source does your community get its drinking water? Choose all answers that apply."
Pre
Post
Clouds
Glaciers and Icebergs
Groundwater/Aquifers (wells)
Lake
Ocean
River
0.00%
20.00%
40.00%
60.00%
80.00%

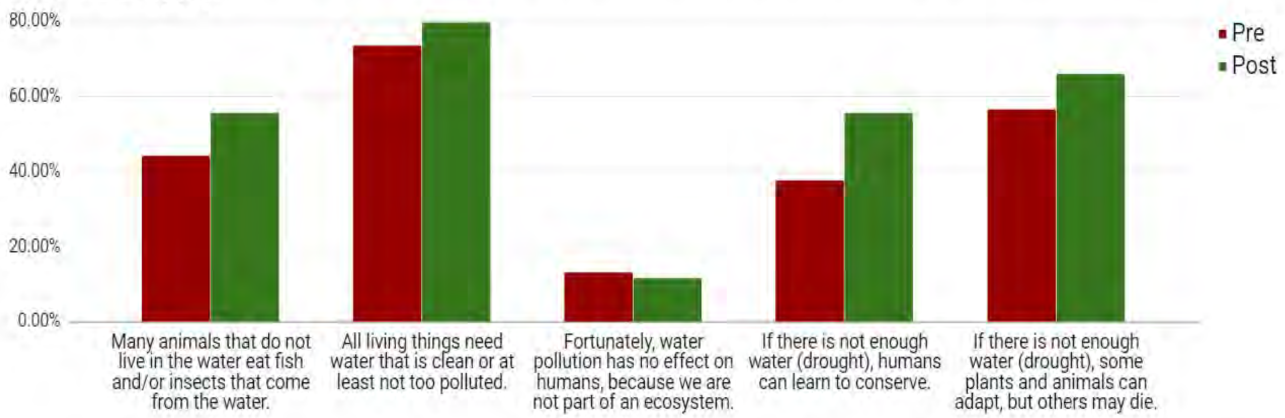

Change in Responses to the Question: "Which of these things use our precious, clean drinking water? Choose all answers that apply."
Pre
Post
87.50%
85.00%
82.50%
80.00%
77.50%
75.00%
72.50%
washing dishes
brushing teeth
showering
drinking
watering yard with rainwater
watering yard with a hose
flushing toilets
washing clothes
a leaky faucet
a leaky roof


What are some of the ways scientists can determine the health of a river, lake, bay or ocean? Choose all answers that apply.
Pre
Post
80.00%
60.00%
40.00%
20.00%
0.00%
They can look under its tongue or in its ears.
They can check pH, turbidity, temperature, and dissolved oxygen.
They can look at the types of macroinvertebrates that are living in it.
If the water looks clean, they know it is healthy.
They can look at the diversity of animals and plants living in and around it.
If they see a lot of bugs in the water, they know it is polluted.

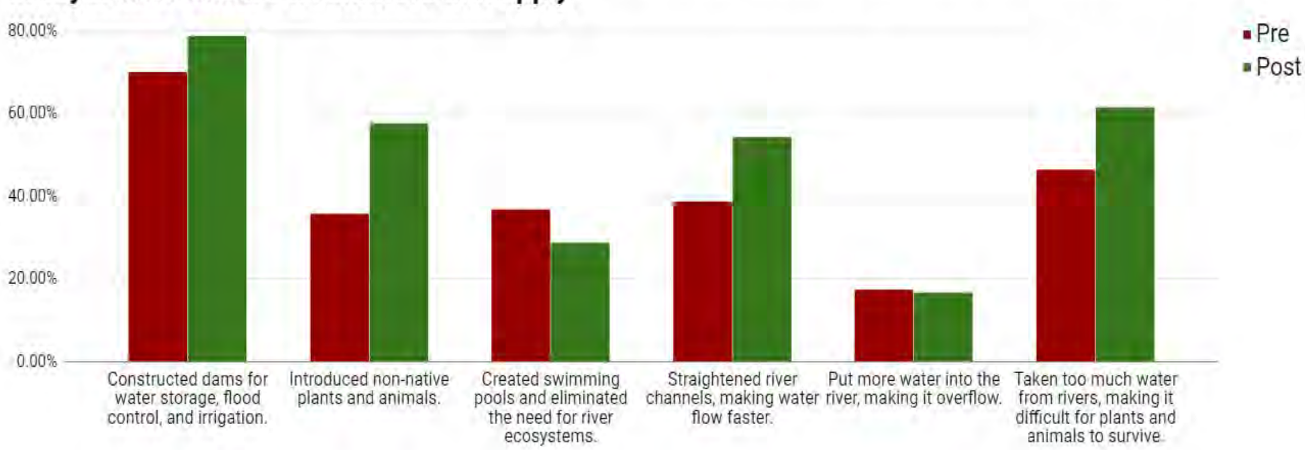
Change in Responses to the Question: "What can farmers do to conserve water or prevent pollution of our water resources? Choose all answers that apply."

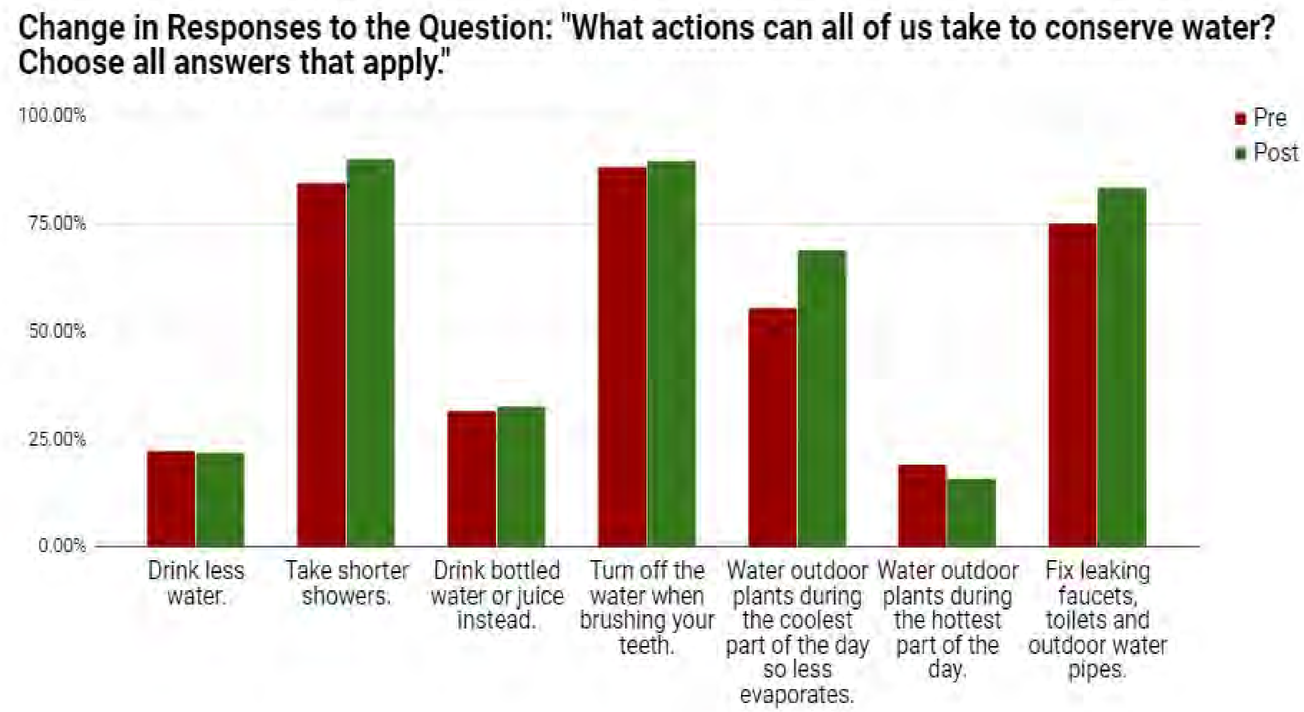


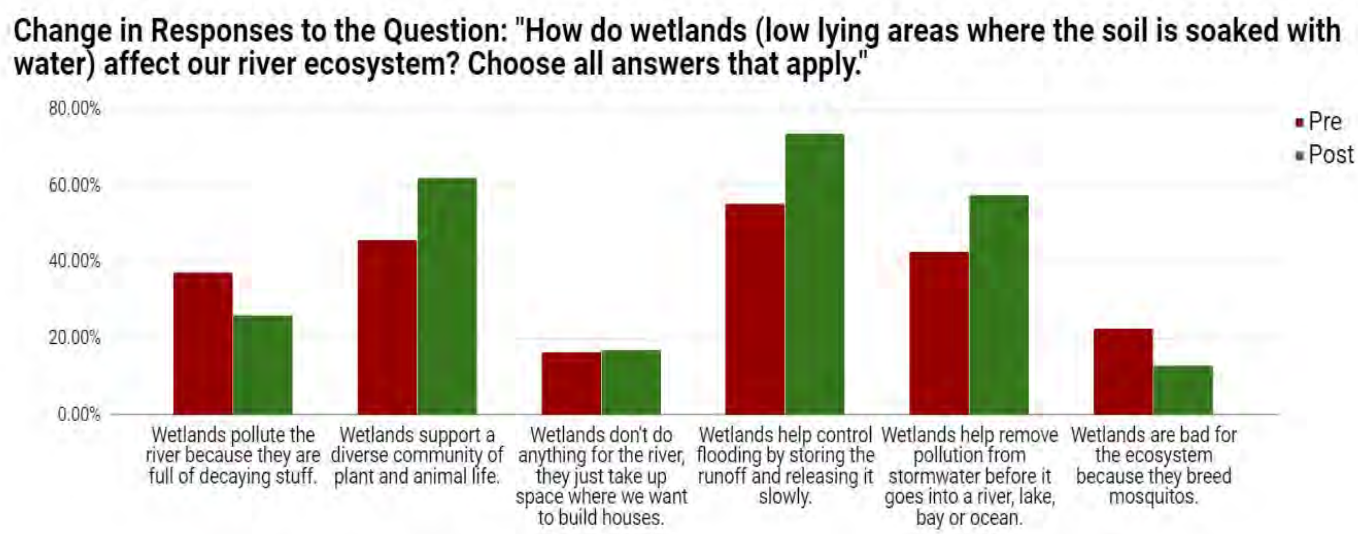
Change in Response to the Question: " How does water affect living things in an ecosystem? Choose all answers that apply."



Change in Responses to the Question: "What are some of the ways that humans have changed river ecosystems? Choose all answers that apply."




Change in Responses to the Question: "What actions can all of us take to conserve water? Choose all answers that apply."
100.00%
75.00%
50.00%
25.00%
0.00%
Pre
Post
Drink less water.
Take shorter showers.
Drink bottled water or juice instead.
Turn off the water when brushing your teeth.
Water outdoor plants during the coolest part of the day so less evaporates.
Water outdoor plants during the hottest part of the day.
Fix leaking faucets, toilets and outdoor water pipes.


Change in Responses to the Question: "How do wetlands (low lying areas where the soil is soaked with water) affect our river ecosystem? Choose all answers that apply."
80.00%
60.00%
40.00%
20.00%
0.00%
Pre
Post
Wetlands pollute the river because they are full of decaying stuff.
Wetlands support a diverse community of plant and animal life.
Wetlands don't do anything for the river, they just take up space where we want to build houses.
Wetlands help control flooding by storing the runoff and releasing it slowly.
Wetlands help remove pollution from stormwater before it goes into a river, lake, bay or ocean.
Wetlands are bad for the ecosystem because they breed mosquitos.

Student Writing

The writing component is one of the most valuable aspects of the program, yet it continues to be our biggest challenge. We are continually striving to improve participation in this area because it helps teachers integrate writing in the content areas and reinforces student understanding of key water resources concepts. Teachers continued to face major challenges this year in getting efficient internet access in the classroom and/or access to computer labs, which are tied up for much of the year for NM teachers with the PARCC and other computer based tests.

Many teachers joined the program this year planning to use RiverXchange as a major component of their writing program to meet Common Core Language Arts standards, which require teachers to focus more on writing within content areas. Each year, we strongly encourage teachers to have students write and edit paragraphs before going to the computer lab because this promotes higher quality thinking and writing. When students do go through this process, it shows. We also encouraged teachers to use various forms of communication in addition to writing, such as videos, PowerPoint presentations, or audio files.

We had a couple of partner classes from different regions of NM. This encouraged a greater understanding of different sections of the Rio Grande for students.Many partner teachers register for the program having already prioritized the need to organize classroom time to blog throughout the school year, so as to ensure they have a successful experience as participants. In contrast, many NM teachers register for the program to receive the beneficial learning experiences of the presentations and field trip; the blogging and partnership aspect is not as strong of an incentive for their participation as it is the main incentive for the partner teachers.

We know from discussions with teachers over the years that the absence of student writing does not mean they did not do the activities, or that no learning took place. Many teachers were dealing with issues unrelated to the program, such as new curriculum in other areas, school reorganization, construction which prevented access to the computer lab for a portion of the year, or personal life changes that conflicted with engaging more with the program. We did our best to foster successful online partnerships. Even though some blogs had minimal to no activity, NM students still benefited from the guest speakers and the field trip.

Appendix 1 includes the RiverXchange curriculum, Appendix 2 includes post presentation questions and follow up activities, Appendix 3 includes photos.

Appendix 1

Curriculum

Welcome to RiverXchange... exploring watersheds through global collaboration!

RiverXchange is about communication and developing 21st Century Skills while learning about our watersheds! Each class will be partnered with one or more classes in a different state. **The big idea is to communicate with your partners *at least twice each semester* by posting projects on your shared private educational blog and responding to what your partners have posted.**

The Big Water Questions

Understanding a Watershed

- What is a watershed?
- Where does your community's stormwater go?
- How can surface water become polluted?
- How does the water cycle relate to weather?
- What role do forests play in a watershed?
- What role do wetlands play in a watershed?
- What actions can all of us take to keep water clean?

Water in Our Society

- In what ways does our society use water?
- From what source does your community get its drinking water?
- Does everyone have the right to use as much water as they want?
- What actions can all of us take to conserve water?
- How are groundwater and surface water connected?
- How can groundwater become polluted?
- Where does your community's wastewater go?
- What is the difference between wastewater, stormwater, and drinking water?

River Ecosystem

- How does water affect living things in an ecosystem?
- What are some of the ways scientists can determine the health of a river, lake, bay or ocean?
- What are some of the ways humans have changed rivers or other aquatic ecosystems?
- What actions can all of us take to improve the health of our ecosystem?

Student Assignments:

All of the lessons in our curriculum include a “Student Assignment” which can be expressed through writing, photos, video, audio, powerpoint, or other projects. **The only requirement is that you post two projects each semester, and respond to what your partners have posted.** This new format supports the essence of our program - meaningful sharing between classes.

Suggestions include:

- Create a public service announcement
- Create a news cast with various reporters discussing different areas
- Create a short documentary
- Write a environmental journalistic piece based on water challenges in your community
- Create an animation (using a tool such as kid pix)
- Create a powerpoint presentation
- Write a poem
- Write a book report for one of the suggested books
- Create a poster and post a photo of it on the wiki

We know that with all the other pressures in schools today, it may be difficult to find time to share on the wiki. Here are some suggestions we have gathered over many years of working with teachers on this great program.

Strategies for making the most of limited computer time:

1. **Take videos on your smartphone, then post them yourself to group pages**
2. **Take pictures of posters or hand written assignments, then post to group pages.**
3. **Do a whole class project/posting using the Promethean or Smart Board.** For instance, write down all the things that can pollute our river, group them by source/non-source, identify which ones the kids can help prevent, save and post the final diagram in each of the groups on the wiki.
4. **Read postings from partners using Promethean or Smart Board, as a “Friday fun day” activity** on the weeks they have posted. This could be done as a reading aloud/public speaking exercise.
5. **Identify and train one student from each group to be the “tech leader.”** Have just these students use the limited classroom computers to post the group projects.
6. **Encourage posting from home as homework.** Just be sure to monitor what was posted the next day. Even if not all students have computers at home, some will. Consider dividing students up so that at least one person in each group has computer access at home, and they could become the “tech leader.”

Strategies for planning and integrating with other curriculum:

1. When looking at your plans for the year, for all subjects, keep RiverXchange in mind. Remember, if you want to post “out of order” that is fine!
2. Modify the style of writing to match what you are planning to cover at that point in the year.
3. Posting shortly after a guest speaker comes to your class is recommended, so you could also consider rearranging your language arts curriculum (and scheduling your computer lab time) to coordinate with times when presenters are scheduled.
4. Whatever subject you enjoy the most, see how you can use RiverXchange to enhance it.
    a. Social studies: history of why early settlers lived where they did, economic impact of rivers and water, use of water by industries
    b. Math: calculate water use, waste, length of rivers, etc
    c. Science: volume, density, states of matter
    d. Language arts: writing is obvious but also poetry, reading informational texts, public

speaking

e. Other specialized topics such as engineering, careers, art, music

New Mexico Curriculum Overview

Remember, partners in other states may be doing their own curriculum, but we hope you will be able to have good discussion on several of these topics over the course of the year. You may also want to combine some of the lessons so that students do a project that incorporates elements of multiple topics from the curriculum. For example, you could have students write about their river's geography while also talking about its watershed and ways to keep pollution out of it.

Unit 1: Understanding a Watershed

1. River Geography
2. Watershed Model
3. Infiltration and Runoff
4. Forests and Wetlands

Unit 2: Water in Our Society

5. Commercial Uses of Our Rivers
6. Drinking Water
7. Groundwater
8. Wastewater

Unit 3: River Ecosystems

9. Field Trip (with pre and post activities)

Unit 1: Understanding a Watershed

Project 1: River Geography

Student Assignment

Write a friendly letter to your partners or create another type of project, explaining:

a) what a watershed is

b) the name of your river - this is also the name of your watershed!

c) the journey of your river from its headwaters to the ocean

d) what the river is like in your area - big/small, clear/muddy, fast/slow?

e) how much precipitation your area receives each year, and what season gets the most precipitation

Informational Texts

- *Follow the Water from Brook to Ocean*, by Arthur Dorros or *Paddle-to-the-Sea*, by Holling C. Holling
- *KRQE* news. "Moisture Makes One-Third of New Mexico Drought-Free" http://krqe.com/2015/05/26/moisture-makes-one-third-of-new-mexico-drought-free/

Classroom Activity – Flexible! Just do as much as you want, and feel free to substitute other activities.

1. Read the book, *Follow the Water from Brook to Ocean,* by Arthur Dorros (about the Colorado River) OR *Paddle-to-the-Sea*, by Holling C. Holling (most U.S. School or public libraries have one or the other, or they can be purchased online). Explain how water flows from smaller bodies of water into a larger body.
2. Show the *All About Watersheds* poster (see link below.) Introduce the concept of a **watershed** as the land area that drains into a body of water, and explain that this is where **surface water** comes from.
3. Show students the *U.S. Watersheds Map* (see link below), pointing out your watershed and your partners' watershed. Talk about the significance of the *Continental Divide* (see link below) in North America, and show them where it is in New Mexico. Ask students "Is every place in the world part of a watershed?" Even if there are no hills or mountains, and there is no visible surface water, every place IS in a watershed because precipitation that falls on that land area eventually drains somewhere.
4. Have students identify your river or stream on a large classroom map, and show them where your school is located in relation to your river (north, south, east, west). Figure out where your river or stream starts **(headwaters)**, what **tributaries** flow into it, and what ocean it flows into at its **delta** (many students may not know that the Gulf of Mexico is part of the Atlantic Ocean).
5. Point out what towns (if any) are upstream from you and discuss how they could affect your water (quantity and quality) either positively or negatively. Discuss what towns are downstream (if any) and how your town could affect their water, either positively or negatively. Trace your river's path to the ocean, recording each body of water it passes through.
6. Locate your school and your partners' school on the *Precipitation Map* (see link below). How many inches of precipitation does your area receive? Compare with your partner's ecosystem. You may want to read the Albuquerque Journal article (see link above) about the drought in New Mexico.
7. Discuss seasons, timing of your area's precipitation, the altitude of your area and how these affect weather. Explain how **precipitation** and **snowpack** affect the river.
8. Show students the *Major Cities and Rivers Map* (see link below), and ask them why they think so many big cities are located near major bodies of water.
9. ***Optional:*** If you have time, students (or groups of students) could research major flora and fauna in different regions along the length of your river or tributaries and create a picture postcard from that place. Or, they could write a story about a journey down the river.
10. ***Optional:*** New Mexico classes -- for more information about the Rio Grande watershed in New Mexico, show students the *Everything is Connected in a Watershed* poster (in teacher packet), then visit the *All About Watersheds* website (see link below) to explore the interactive version.

11. ***Optional:*** Learn about the Great Pacific Garbage Patch and ocean gyres, using the PBS lesson plan and video (see link below). You may also want to show photos taken by Chris Jordan on Midway Atoll demonstrating the effects of wildlife consuming plastic.

Materials

- *U.S. Watersheds* map: http://maps.howstuffworks.com/united-states-watersheds-map.htm
- *Basic information about the Continental Divide:* http://education.nationalgeographic.com/encyclopedia/continental-divide/
- *Precipitation Map:* http://www.wrcc.dri.edu/pcpn/us_precip.gif
- *Major Cities and Rivers Map:* http://cgee.hamline.edu/rivers/Resources/watershedmaps/quiz3.htm
- *Everything is Connected in a Watershed* poster and *All About Watersheds* website link: http://allaboutwatersheds.org/poster/poster_view
- ***Optional:*** Great Pacific Garbage Patch lesson plan http://www.pbs.org/kqed/oceanadventures/video/gyre and Laysan Albatross photos http://ocean.si.edu/slideshow/laysan-albatrosses%E2%80%99-plastic-problem **(Caution - these photos are pretty graphic, so be sure to preview before sharing with students.)**

Vocabulary

- **Watershed:** The land area from which snowmelt and rain drain into a river, lake or other body of water. Also known as a drainage basin or catchment.
- **Surface water:** Water collected on the ground or in a waterbody such as a stream, river, lake, wetland or ocean.
- **Continental Divide:** A drainage divide on a continent (in the U.S., the Rocky Mountains) such that the drainage basin on one side of the divide feeds into one ocean or sea, and the basin on the other side either feeds into a different ocean or sea.
- **Headwaters:** The source of a river (where it starts).
- **Tributary:** A creek, stream, or river which feeds a larger stream or river or a lake.
- **Delta:** The mouth of a river (so named because it is triangle-shaped like the Greek capital letter Delta).
- **Desert:** A region that receives less than 10" of precipitation per year.
- **Precipitation:** All the water that falls from the sky, in solid or liquid form, such as rain, snow or hail.
- **Snowpack:** The amount of snow that accumulates annually in a mountainous area.
- **Floodplain:** Land that may be submerged by flood waters, or a plain built up by materials deposited by a river.

Project 2: Watershed Model

For NM classes, this is presented by a guest speaker. For partner classes, we encourage you to see if you can find someone from a local agency who has a watershed model, such as the Enviroscape.

Student Assignment

Write a *persuasive* paragraph, or create another type of project, about why it is important to keep stormwater clean and what we should do.

Informational Texts

- *Science News for Kids* article. "Suffocating Waters" http://www.d123.org/olhms/dedie/documents/suffocatingwaters.pdf
- *CNN* article. "Garbage Man of the River" http://www.cnn.com/2013/04/18/us/cnnheroes-pregracke-rivers-garbage

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Watch *The Human Solution to Water Pollution* video (see link below).
2. Schedule a guest speaker to bring a model of a **watershed**, OR make your own using the activity on the back of the USGS poster – *Watersheds: Where We Live* (the poster can be shown on a smartboard – see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page).
3. Discuss how the gutters in our streets lead to **storm drains**, which often lead directly to the nearest body of water. Discuss the difference between **stormwater** and **wastewater** (from household drains and toilets). Find out how your community handles stormwater – is it combined with a municipal wastewater (sewage) system?
4. Read news articles (see links above) about garbage in rivers and dead zones caused by nutrients in agricultural runoff. Review the *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet), and brainstorm other ways to reduce **nonpoint-source pollution**.
5. ***Optional:*** For a great math-based extension activity, try *Don't Trash Our Rio* (in teacher packet) where students learn how much trash is pulled from Albuquerque's storm drain system yearly, and calculate how many trash bags or classrooms it would fill. Even though it is based on an Albuquerque news article, this activity is applicable to any area that has a storm drain system.
6. ***Optional:*** Watch *The Majestic Plastic Bag* video (see link below).
7. ***Optional: New Mexico classes,*** watch *Segment 3* of the Mid Rio Grande Stormwater Quality Team's educational video (link below) to learn about Albuquerque's and Rio Rancho's stormwater system.
8. ***Optional: Partner classes,*** Google "stormwater" in your area and see what information is there. Water districts, the Departments of Health and Environment etc. have many educational resources.

Materials

- *The Human Solution to Water Pollution* video (to right of screen): http://sscafca.org/teacher-resources/
- *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet and on wiki Curriculum page)
- Watershed model such as Enviroscape, **OR** USGS poster – *Watersheds: Where We Live* (the poster is available at http://water.usgs.gov/outreach/Posters/watersheds/grade.html and a printable copy of the activity is on the RiverXchange Curriculum Page) and supplies:
  - Butcher paper (or newspaper) and plastic wrap
  - Several large baking pans or plastic containers (clear ones can be reused for Project 4: Groundwater)
  - Waterproof marker
  - Spray bottles filled with water
  - Small plastic houses, cows and cars (or little pieces of modeling clay to represent these)
  - Cocoa powder and colored drink powders
- ***Optional:*** *Don't Trash Our Rio* activity (in teacher packet)
- ***Optional:*** *The Majestic Plastic Bag* video: https://vimeo.com/14221747

- ***Optional:*** Watch *Segment 3* (16:05-end) of the Mid Rio Grande Stormwater Quality Team's educational video: http://www.keeptheriogrand.org/keeping-the-rio-grand/

Vocabulary

- **Watershed:** The land area from which snowmelt and rain drain into a river, lake or other body of water. Also known as a drainage basin or catchment.
- **Point-source pollution:** Water pollution coming from a single point, such as a sewage-outflow pipe or a factory.
- **Nonpoint-source pollution:** Water pollution coming from a wide land area, not from one specific location. Occurs when rainwater, snowmelt, or irrigation runs off plowed fields, city streets, or suburban backyards, picking up soil particles and pollutants, such as nutrients, pesticides, and other chemicals.
- **Storm drain:** A drain, often under sidewalks, designed to collect excess rain and ground water from impermeable surfaces such as streets, parking lots, sidewalks, and roofs. Also known as a storm sewer.
- **First flush:** The first surface runoff of a rainstorm. This is when we see the highest levels of pollution in water entering the storm drains.
- **Stormwater:** Runoff from a storm which either flows directly into a water body or is channeled into storm drains, which eventually discharge to surface waters.
- **Wastewater:** All the water that goes down a drain into a municipal sewer system or septic system. Also known as sewage.

Project 3: Infiltration and Runoff

Student Assignment

Where does rainwater go when it falls on your school grounds? Write a *RACE* paragraph, or create another type of project, using evidence from your mini-field trip around the school.

Informational Texts

- *USA Today* article. “La Niña Brings Flood Risks, Drought to the West” http://usatoday30.usatoday.com/weather/news/2011-05-12-west-floods-drought_n.htm
- *LA Times* article. “3 days after rain, beach water can still make swimmers ill, study says” http://www.latimes.com/science/sciencenow/la-sci-sn-beach-advisories-storm-runoff-20140303-story.html#axzz2v99eazt7.

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Listen to the *Water Cycle Song* (see link below). You may want to print out the lyrics for students (a printable copy is on the RiverXchange Curriculum Page). Review the six major components of the water cycle: **precipitation, runoff, infiltration, evaporation, transpiration,** and **condensation.**
2. Discuss how the sun’s energy starts the whole process, and how the water cycle relates to weather, recalling the amount and timing of your area's precipitation.
3. Point out that when precipitation hits the ground, it can either run off, sink in (infiltration, also known as percolation) or evaporate back into the air. Explain how all plants move water from the ground to the air through the process of transpiration.
4. Read the *USA Today* article (see link above) and discuss how **La Niña** and **El Niño** bring dry weather or wet weather to your area. Discuss what happens in different areas of the school when you have too much rain – are there areas that flood?
5. Using *Investigating the School Grounds* (a printable copy is on the RiverXchange Curriculum Page) as a guide, take students on a “mini field trip” to investigate where rainwater goes on your school grounds to observe changes in land contours, and the location of downspouts and catchment areas. Discuss where runoff appears to be occurring, what affects infiltration, and the difference between **permeable** and **impermeable surfaces**.
6. Discuss how storm drains carry pollution from impermeable surfaces into the nearest body of water, whereas the process of infiltration into permeable surfaces helps filter out pollution. You may want to read the LA Times article (see link above) about pollution from stormwater.
7. Discuss how runoff can cause flash floods. In Albuquerque, concrete-lined arroyos are very dangerous because runoff comes from a larger area and the water moves very fast – people have drowned. In Rio Rancho, the arroyos in their natural state are generally safe unless rain clouds are visible.
8. ***Optional:*** For a math-based extension, test infiltration on various surfaces, using *Does it Soak Right In?* (a printable copy is on the RiverXchange Curriculum Page) as a guide. Graph the data as a class to build data analysis skills.

Materials

- *Investigating the School Grounds* activity (a printable copy is on the RiverXchange Curriculum Page)
- *Water Cycle Song:* http://www.abcwua.org/education/music/water%20cycle%20song.mp3
- *Water Cycle Song* lyrics (a printable copy is on the RiverXchange Curriculum Page)
- ***Optional:*** *Does It Soak Right In?* activity (a printable copy is on the RiverXchange Curriculum Page)
  - A soup can for each group, all the same size, with both ends cut off
  - Stopwatches
  - Rulers
  - Measuring cups

Vocabulary

- **Precipitation:** All the water that falls from the sky, in solid or liquid form, such as rain, snow or hail.
- **Runoff:** The rain or snow that does NOT sink into the ground, that runs off the land into a river, lake or other body of water (often carrying dirt and pollution with it).
- **Infiltration:** The process of water sinking down into the ground to refill the aquifer. Also called percolation.
- **Evaporation:** The process by which water changes from liquid to vapor (water in a puddle, river, lake, ocean, or other body of water evaporates into the air).
- **Transpiration:** The process by which water comes out of the leaves of plants, primarily through openings in the leaves, and goes into the air.
- **Condensation:** The process by which water changes from vapor to liquid (water in clouds condenses to form rain).
- **Impermeable surface:** A material that water can NOT soak into (or infiltrate); also called an impervious surface.
- **Permeable surface:** A material that water can soak (or infiltrate) into; also called a pervious surface.
- **Flash flood:** A rapid flooding (less than six hours) of low-lying areas (such as washes, rivers, dry lakes, basins), caused by heavy rain, snow or sudden ice melt in surrounding areas.
- **Arroyo:** A Spanish word for a drainage ditch, gully or ravine which was carved by water drainage.

Project 4: Forests and Wetlands

Student Assignment

Write a *persuasive* paragraph, or create another type of project, about why wetlands and forests are important in our watersheds.

Informational Texts

- *ABQ Journal* article. "River Diversions Halted Due to Burn Scar Runoff" http://www.abqjournal.com/45855/abqnewsseeker/river-diversions-halted-due-to-burn-scar-runoff.html
- American Forests. "Forests and Water" https://www.americanforests.org/conservation-programs/forests-and-water/
- *Rapid City Journal* article. "Federal Government Confirms Wetland Channels Are Keeping Rap id Creek Cleaner" http://rapidcityjournal.com/news/local/federal-government-confirms-wetland-channels-are-keeping-rapid-creek-cleaner/article_b2a2e469-5100-5a66-866d-0733f183b0ee.html

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Watch *The Adventures of Junior Raindrop* video (see link below) to learn about how vegetation helps prevent **erosion**.
2. Read the *ABQ Journal* article (see link above) about erosion from wildfires polluting the Rio Grande.
3. Do the *Wetland Model* activity from the back of the USGS poster – *Wetlands: Water, Wildlife, Plants* (the poster can be shown on a smartboard – see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page) to examine the effects of a **wetland** in reducing erosion and controlling flooding.
   - To model forests in the watershed, stick cotton balls in the clay and repeat the experiment again to see that the muddy water gets even cleaner as it travels through the "forest."
4. Even in desert areas like New Mexico, there are wetlands, and **riparian areas**. Many are constructed (man-made) specifically for cleaning stormwater. Read the *Rapid City Journal* article (see link above) on how constructed wetlands help keep their creek clean. Discuss how these areas also support a diverse community of living things, and how many people used to think wetlands were not important. In fact, they would fill them in with soil and build right on top of them!
5. Find books from your library on different kinds of wetlands, and discuss the differences in wildlife and plant communities they support – *OR* watch the *NatureWorks* video (see link below).
6. ***Optional:*** Do the *Water Treatment Plants* activity (see link below) to see how celery sticks, like wetland plants, can help filter water by absorbing pollution. This activity is very quick to set up, then just wait one day to see what happens.
7. ***Optional: New Mexico classes,*** watch the section about Sanchez Farm in the Mid Rio Grande Stormwater Quality Team's educational video (link below) to learn how a constructed wetland helps clean stormwater.

Materials

- *The Adventures of Junior Raindrop* video: http://www.archive.org/details/Adventur1948
- USGS poster – *Wetlands: Water, Wildlife, Plants.* The poster is available at http://water.usgs.gov/outreach/Posters/wetlands/middle.html, and a printable copy of the activity is on the RiverXchange Curriculum Page.
- Supplies:
   - Small rectangular plastic storage containers, or baking pans or paint trays
   - Modeling clay
   - Small pieces of carpet
   - Cotton balls

- *NatureWorks* video http://video.nhptv.org/video/1491178229
- ***Optional:*** *Water Treatment Plants* activity (a printable copy is on the RiverXchange Curriculum Page)
  - Celery sticks
  - Cups of colored water
- ***Optional:*** *Keeping the Rio Grand* http://www.keeptheriogrand.org/keeping-the-rio-grand/, the Mid Rio Grande Stormwater Quality Team's educational video (the part about the constructed wetland is from 13:12 - 16:01)

Vocabulary

- **Erosion:** The process in which a material (such as a river bank) is worn away by water or air, often due to the presence of abrasive particles in the stream.
- **Wetland:** An area such as a marsh or swamp that is covered with shallow water or where the soil is naturally soaked with water.
- **Riparian area:** The area around the banks of a natural body of fresh water, where the vegetation and landscape is directly influenced by that water.

Unit 2: Water in Our Society

Project 5: Commercial Uses of Our Waterways

For NM classes, this is presented by a guest speaker from the county's Cooperative Extension. For partner classes, we encourage you to see if you can find someone from a local agency or business who can present on this topic.

Student Assignments

Write an *informational* paragraph or a *friendly letter* to your partners, or create another type of project, explaining:

a) How was the river (or other waterway) important when people first settled in your community?

b) How has your waterway been used by people for commerce (to make money) in your community's history?

c) Do some people still rely on the waterway for their jobs, such as farming, fishing, shipping, or recreation?

d) What technologies have people developed to solve water problems in your area (like drilling wells, building dams, locks, and fish ladders, different kinds of irrigation, or technologies to conserve water or prevent pollution?)

Informational Texts

- *ABQ Journal* article. "Deal Allows Farmers to Sell Irrigation Water" http://www.abqjournal.com/221194/news/deal-allows-farmers-to-sell-irrigation-water.html
- *National Geographic* article. "Parched: A New Dust Bowl Forms in the Heartland" http://news.nationalgeographic.com/news/2014/05/140516-dust-bowl-drought-oklahoma-panhandle-food/

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Research the major commercial use(s) of your river/waterway (such as agricultural **irrigation**, shipping/transportation, electricity, fisheries and/or recreation) and invite a guest speaker to present, or find an activity that relates. In New Mexico, the only major commercial use of the Rio Grande is agriculture – 80% of the water goes to irrigation!
2. Discuss how these commercial uses influenced the location/history of your community, and how these users can also help a community conserve water and keep water clean (such as conserving water when irrigating, controlling **erosion**, keeping boat engines in good repair).
3. Discuss how people have developed technological solutions to solve water problems. For example, many ancient settlements in the West were abandoned because of lack of water, but irrigation technology has made it easier to survive. Dams have made it easier to control the flow of rivers, reservoirs store water, and fish ladders are built so that dams don't prevent their migration. High-efficiency toilets and other appliances help conserve water.
4. In NM, discuss the **acequia** system which was put in place by the Pueblo people and early Spanish settlers. Watch one of the YouTube videos if possible (see links below) or read the *Albuquerque Journal* article about water rights (see link above).
5. Show students the USGS poster - *Navigation: Traveling the Water Highways* (the poster can be shown on a smartboard - see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page). Discuss how some communities use their river for transportation, while New Mexico rivers are used mainly for agricultural irrigation. New Mexico students may not be familiar with **dams, locks** and boats traveling on the river. If your river is used for transportation, you may want to do the *River Profile* activity on the back of the poster.
6. ***Optional: Water Ripples games*** (see link below**)**. Review ways our society uses water, particularly in agriculture.
7. ***Optional: Water Rights.*** Using the *Pass the Jug* activity guide (see link below), act out the two different methods of assigning water rights to all the water users. Discuss the difference between the Riparian Rights and Prior Appropriation doctrines. Research the history of water rights in your community and compare the

differences in water rights issues with your partners' area. Prior Appropriation is used in the western states, which receive far less precipitation. Revisit the *Precipitation Map* and discuss why this makes a difference. Read about farmers being allowed to sell their water rights to allow more water for the ecosystem.

Materials

- USGS poster - *Navigation: Traveling the Water Highways.* The poster is available at http://water.usgs.gov/outreach/Posters/navigation/grade.html, and a printable copy of the activity is on the RiverXchange Curriculum Page.
- ***Optional: Water Ripples games.*** http://aces.nmsu.edu/ces/watertaskforce/water%20ripples%20gameshow%20quiz/index.html
- ***Optional: Water Rights***
  - Prior Appropriation Game http://www.troutintheclassroom.org/sites/www.troutintheclassroom.org/files/documents/PriorAppropriationGame.doc
  - *Precipitation Map*: http://www.wrcc.dri.edu/pcpn/us_precip.gif
  - *Ancient Irrigation* video: http://www.youtube.com/watch?v=RUv2Tz1ayTc
  - *Ditch Cleaning at Arroyo Hondo* video: http://www.youtube.com/watch?v=YyqxdbsEObU

Vocabulary

- **Irrigation:** Watering crops. When natural precipitation is not enough for crops, farmers use flood irrigation (common in New Mexico), drip irrigation and/or overhead sprinklers.
- **Acequia:** An irrigation ditch used to distribute water from rivers to farms. Most are simple ditches with dirt banks, but they can be lined with concrete. An important form of irrigation in the development of agriculture in the American Southwest.
- **Erosion:** The process in which a material (such as a river bank) is worn away by water or air, often due to the presence of abrasive particles in the stream.
- **Dam:** A barrier built across a river to hold water back; sometimes used to generate electricity.
- **Lock:** A chamber with gates that close off for raising and lowering boats on a river or canal.

Project 6: Drinking Water

For NM classes, this is presented by a guest speaker from the water utility. For partner classes, we encourage you to see if your local utility can send someone to present.

Student Assignments

Write a *persuasive* paragraph (or create another type of project) explaining why it is important to conserve water, and what we should do.

Informational Texts

- Santa Fe drinking water article (a printable copy is on the RiverXchange Curriculum Page)
- Albuquerque drinking water article (a printable copy is on the RiverXchange Curriculum Page)
- *LA Times* article. "Americans use twice as much water as they think they do, study says" http://www.latimes.com/science/sciencenow/la-americans-underestimate-personal-water-usage-study-says-20140227-story.html#axzz2v99eazt7
- *A Long Walk to Water*, by Linda Sue Park (2010: Clarion Books, 128 pages)
- "How Does Water Use in the United States Compare to That in Africa?" https://www.awf.org/blog/how-does-water-use-united-states-compare-africa

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Discuss the *Indoor Water Use* graph (see link below), emphasizing that all of these activities use clean **drinking water.** Explain that in homes and other buildings there is one set of pipes that bring clean drinking water into the home and a different set of pipes that takes the dirty water away. Be sure to mention that in many parts of the country (like in NM) people use almost as much for watering plants outdoors as all their indoor water use combined. Discuss how **xeriscape** and watering during the coolest part of the day can help.
2. Schedule a guest speaker to present on where your drinking water comes from, how it is treated to make it safe for drinking, and/or ways to conserve water. **OR** research where your drinking water comes from, and do *The Value of Water* activity from the back of the USGS poster - *Water: The Resource That Gets Used & Used & Used For Everything* (the poster can be shown on a smartboard - see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page). Students will examine their water use by using play money to record their daily usage, then brainstorm how to **conserve**. For a math-based extension activity, you can graph the data as a class to build data analysis skills.
3. Discuss how flooding or drought can affect your community's drinking water. Look for articles in your local paper, or read one of the suggested articles (see links above).
4. ***Optional: Water Footprint.*** Calculate your impact using an online tool (see link below).
5. ***Optional: Water Use in Other Countries.*** To learn more about water use in other countries, read the article about water use in Africa (see link above), invite a guest speaker from Water for People (see link below) and/or watch the *Water for Life* video, and/or read the book *A Long Walk to Water*, by Linda Sue Park. Compare average indoor water use in the U.S. to that in other nations.
6. ***Optional: The Water-Energy Connection.*** Show students the *Power Couple* video and/or water-energy posters to learn about the connection between electricity and water use, then do the activity (see links below.).

Materials

- *Indoor Water Use Graph* http://www.epa.gov/WaterSense/pubs/indoor.html
- USGS Poster – *Water: The Resource That Gets Used & Used & Used For Everything.* The poster is available at http://water.usgs.gov/outreach/Posters/water_use/grade.html, printable copy of the activity is on the RiverXchange Curriculum Page.
- ***Optional: Water Footprint Calculator***
  - http://environment.nationalgeographic.com/environment/freshwater/change-the-course/water-footprint-calculator/

- ***Optional: Water Use in Other Countries***
    - Find a guest speaker from your local Water for People Committee: http://www.waterforpeople.org/take-action/volunteer
    - OR *Water for Life* video: http://www.archive.org/details/Unworks-MTV-WFL
- ***Optional: The Water-Energy Connection***
    - *Power Couple: The Shocking True Story of Water and Electricity* video, with viewers' guide and posters. http://www.abcwua.org/education/Energy_Water_Nexus.html
    - *Understanding the Energy Demand of Bottled Water.* http://www.earthday.org/sites/default/files/3.%20Understanding%20the%20Energy%20Demand%20of%20Bottled%20Water_5-8%20Lesson%20Plan.pdf

Vocabulary

- **Drinking water:** Water that has been purified to standards set for human consumption.
- **Xeriscape:** The use of low water use plants in landscape (*not* "zeroscape".) *Xeros* is Greek for "dry."
- **Conserve:** To use something wisely; not wasting.
- **La Niña:** An irregularly occurring movement of deep cold water to the ocean surface along the western coast of South America that brings less precipitation to the southern U.S. and more to the northern U.S.
- **El Niño:** An irregularly occurring flow of unusually warm surface water along the western coast of South America that brings more precipitation to the southern U.S. and less to the northern U.S.

Project 7: Groundwater

Student Assignment

How are groundwater and surface water connected? Write a *RACE* paragraph, or create another type of project, using what you learned from the aquifer model.

Informational Texts

- *ABQ Journal* article. "State: Kirtland Jet Fuel Leak Massive" http://www.abqjournal.com/upfront/042254588838upfront05-04-10.htm
- *ABQ Journal* article. "KAFB Ramps Up Fuel Spill Cleanup" http://www.abqjournal.com/161358/news/kafb-ramps-up-fuel-spill-cleanup.html
- *LA Times* article. "Groundwater contamination a growing problem in L.A. County wells" *http://www.latimes.com/visuals/graphics/la-me-g-drought-wells-20150520-htmlstory.html*

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Watch *The Story of Groundwater* video (see link below) to learn the difference between **groundwater** and **surface water.**
2. Show students the *Major U.S. Aquifers* map (see link below) and locate your **aquifer**.
3. Do the activity *Recharge-Discharge* from the back of the USGS poster – *Groundwater: The Hidden Resource* (the poster can be shown on a smartboard – see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page). Students build a simple aquifer model to learn about the **water table**, how a **well** works, and how groundwater and surface water are connected. Discuss how if we pump too much of surface water it can deplete groundwater, and vice versa. Also, if one person pumps too much groundwater from their well, it can affect their neighbors' wells.
4. Leaking underground tanks (such as septic tanks or gas tanks beneath gas stations) are a major source of groundwater pollution. This can be demonstrated using small plastic cups with holes poked in the bottom. Sink a cup into the gravel of the model and fill it with colored water to see how pollution spreads through groundwater. Note that contaminated groundwater can pollute surface water and vice versa.
5. Read articles from the Albuquerque Journal about a jet fuel leak from Kirtland Air Force Base (see links above) or find articles about similar issues in your area. Discuss what types of pollution can get into groundwater and what can't. Solids such as trash and dog poop on the earth's surface cannot travel down to the aquifer. Dissolved chemicals, heavy metals, and very large amounts of farm animal waste can, however.
6. Read the resources about groundwater from the Groundwater Foundation (see links below). Review the *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet). Brainstorm other ways to prevent groundwater pollution.

Materials

- *The Story of Groundwater* video. https://archive.org/details/Groundwater_Animation
- *Major U.S. Aquifers* map: http://pubs.usgs.gov/ha/ha730/ch_a/gif/A004_us.gif
- *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet)
- USGS poster – *Groundwater: The Hidden Resource.* The poster is available at http://water.usgs.gov/outreach/Posters/groundwater/grade.html and a printable copy of the activity is on the RiverXchange Curriculum Page.
- Supplies:
  - Several clear baking pans or plastic containers
  - Gravel to fill containers 2/3 full
  - Several pump tops from soft-soap or hand-lotion containers
  - Paper cups with holes punched in the bottom to sprinkle water
  - Colored drink powder

- *The Groundwater Foundation* - Uses of groundwater including chart
  http://www.groundwater.org/get-informed/basics/groundwater.html
- *The Groundwater Foundation* - Contamination
  http://www.groundwater.org/get-informed/groundwater/contamination.html

Vocabulary

- **Aquifer:** A wet underground layer of water-bearing rock or materials (gravel, sand, silt or clay) from which groundwater can be extracted using a well.
- **Groundwater:** Water located beneath the earth's surface in cracks between soil particles and fractures in rock formations. A large and usable quantity of groundwater is called an aquifer.
- **Surface water:** Water collected on the ground or in a waterbody such as a stream, river, lake, wetland or ocean.
- **Water table:** The top surface of an aquifer (how far you have to dig down to find water).
- **Well:** A man-made hole with a pipe that goes down to the water table. A pump helps bring the groundwater up.

Project 8: Wastewater

For NM classes, this is presented by a guest speaker from the water utility. For partner classes, we encourage you to see if your local utility can send someone to present.

Student Assignment

Write a *narrative* or *creative* paragraph, or create another type of project, explaining the journey of your community's wastewater.

Informational Texts

- *KOAT* news. "Aging Pipes Mean Higher Water Bills" http://www.koat.com/news/aging-pipes-could-mean-water-bill-hike/34284754
- Combined sewer overflows article, by Anne Jefferson, a geology professor from Kent State. http://all-geo.org/highlyallochthonous/2013/03/combined-sewer-overflows-solving-a-19th-century-problem-in-the-21st-century/

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Invite a guest speaker to learn about where your community's **wastewater** goes, *OR* if your community has a municipal sewer system, do the activity *Where Does Your Used Water Go?* on the back of the USGS poster - *How Do We Treat Our Wastewater?* (the poster can be shown on a smartboard – see link below; printable copy is on the RiverXchange Curriculum Page).
2. Read the article about Albuquerque's crumbling sewer infrastructure, and/or the article about combined sewer overflows (see links above), or find news articles about issues in your area. If possible, you may want to watch the YouTube video, *A Drop's Life*, about combined sewer overflows in the Washington, DC water system.
3. Show students the *Septic System* poster (the poster can be shown on a smartboard, and a printable copy is on the RiverXchange Curriculum Page) and explain the difference between a **sewer system** and a **septic system** – they both treat wastewater essentially the same way, but a septic tank is right by the house and uses a drainfield in rural areas. If desired, watch the *Dirty Jobs* video (see link below). If your community has mostly septic systems, discuss how important it is to have the tanks pumped out regularly to avoid groundwater pollution.
4. Discuss what kinds of things NOT to put down the drain or toilet – for example, fats, oils, and grease can solidify in pipes and cause a backup. Discuss how treated wastewater is recycled in many communities (such as watering golf courses), and how a community's treated wastewater will be used by downstream communities.
5. Review the differences between **stormwater**, **drinking water,** and **wastewater,** emphasizing how different sets of pipes are involved, and that the "quality" of the water being transported is very different.

Materials

- USGS poster - *How Do We Treat Our Wastewater?* The poster is available at http://water.usgs.gov/outreach/Posters/wastewater/grade.html, and a printable copy of the activity is on the RiverXchange Curriculum Page.
- Supplies:
  - 14 feet of yarn, string or rope
  - Shredded paper or packing peanuts and a cardboard box
- *Septic System* poster (on the RiverXchange Curriculum Page).
- Combined Sewer Overflow video: *A Drop's Life.* Applies to certain cities only, mostly in the eastern US, find out if your city has this type of system. https://www.youtube.com/watch?v=5Ug1hravb9Q
- *Dirty Jobs: Septic Tank Technician* video **(Caution – this video has one bad word at 1:16)** http://home.howstuffworks.com/home-improvement/plumbing/sewer2.htm

<u>Vocabulary</u>

- **Wastewater:** All the water that goes down a drain into a municipal sewer system or septic system. Also known as sewage.
- **Sewer system:** A system of underground pipes used to transport human waste. In some communities, the sewer system is combined with the storm system (known as a combined sewer).
- **Septic system:** A small-scale sewage treatment system common in areas with no connection to a municipal wastewater system. A septic tank is a key component of a septic system.
- **Stormwater:** Runoff from a storm which either flows directly into a water body or is channeled into storm drains, which eventually discharge to surface waters.
- **Drinking water:** Water that has been purified to standards set for human consumption.

Unit 3: River Ecosystem Field Trip

Project 9: Field Trip

Student Assignment

Write a *narrative* paragraph or a *friendly letter* to your partners, or create another type of project, about your field trip:

a) If you tested the water, explain why we collect water quality data and what it means.

b) If you planted trees or did another service learning project, explain how your project will help the river ecosystem.

Informational Texts

- *A Waterproof Case* (in teacher packet)
- *The Water Down Under* booklet (in teacher packet)
- Local ecosystem articles (These are for NM - teachers in other areas should search local newspapers for articles about their own ecosystem).
    - *ABQ Journal* article. "Battle with Beavers" http://www.abqjournal.com/45685/north/battle-with-beavers.html
    - *Santa Fe New Mexican* article. "Crews complete restoration project at Buckman recreation area" http://www.santafenewmexican.com/news/local_news/crews-complete-restoration-project-at-buckman-recreation-area/article_284dd705-05e8-59bb-8585-f00934e93516.html
    - *The Washington Times* article. "NM water release aims to help silvery minnow" http://www.washingtontimes.com/news/2014/may/6/water-release-aims-to-help-silvery-minnow/?page=all

Pre-Field Trip Activities

1. Define an **ecosystem** (the physical environment together with all the species that live there). Discuss how living things depend on the nonliving things, such as water, air, soil/rocks, and the sun.
2. Read *The Water Down Under* booklet to learn more about macroinvertebrates and water quality. Discuss the role of **aquatic macroinvertebrates** in the **food web** and what they can tell us about the health of our ecosystem. Many animals depend on them for food. Some aquatic macroinvertebrates are sensitive to pollution, so one way scientists can tell how healthy a river ecosystem is by looking at which types of macroinvertebrates are living in the water. Many spend only part of their lives in the water, so if the water is polluted, it has far-reaching effects on the ecosystem. Discuss **producers, consumers** and **decomposers**, and where aquatic macroinvertebrates fit (some are consumers, some are decomposers).
3. Talk about the field trip and location, and what students can expect.
4. ***Optional: Frogline News***. Watch a newscast by frogs (see link below) to revisit how pollution gets into surface water. Discuss the significance of frogs (i.e., the frog is a biological **indicator species** because it is very sensitive to water pollution). Remind students of the watershed model and how they can prevent nonpoint-source pollution.
5. ***Optional: Acid Rain***. Watch the video *How Acid Rain Works* (see link below).

Field Trip

1. **For New Mexico Classes:** Field trips may include a service learning project, such as tree planting or an agricultural activity. Otherwise, they will incorporate hands-on lessons about **riparian areas**, wetlands, macroinvertebrates and water quality, and students will use a field journal. On the field trip, students will gather data about pH, temperature, turbidity and dissolved oxygen.
2. **For Partner Classes:** We strongly encourage you to take any water-related field trip available in your area, and we can help if you have trouble finding one.

Post-Field Trip Activity

1. Review how land use affects water quality and what the water quality data tells us about the ecosystem.
   - Increased river temperature can be caused by many things including low river flow, large areas of impermeable surfaces, lack of vegetation, and stormwater that is warm from flowing over roads.
   - High temperature and/or fertilizers (including pet waste) can cause algae bloom, which reduces dissolved oxygen.
   - Erosion or algae bloom can cause turbidity, leading to higher temperature.
   - Acid rain, mine drainage or algae bloom can cause low pH (normally pH is determined by the types of rocks or trees present in the watershed).
2. Read news articles about issues in your local ecosystem. A few articles for NM are provided (see links above).
3. ***Optional: River Food Web.*** Make a food web for your local ecosystem, identifying producers, consumers and decomposers, **native species** and **invasive species,** as well as local **endangered species**. Discuss how wildlife are "water users" too. Like humans, wildlife needs clean water to live, so as a community we must consider their needs when making choices about water. **NM Classes:** use Bosque plant and animal cards to do *The Web* activity (a printable copy is on the RiverXchange Curriculum Page), discussing how all living things depend on each other. **For Partner Classes**: *The Web* activity can be applied to any ecosystem and is a fun way to get kids thinking "on their feet".

Materials

Pre-Field Trip Activities:

- *Frogline News* video: http://www.dailymotion.com/video/x2qhkrw
- ***Optional: Acid Rain.*** *How Acid Rain Works* video, http://science.howstuffworks.com/nature/climate-weather/atmospheric/acid-rain.htm

Field Trip:

- *Macroinvertebrate Data Sheets* (if desired, printable copies are on the RiverXchange Curriculum Page).

Post-Field Trip Activities:

- *World Water Monitoring Challenge* website http://worldwatermonitoringchallenge.com/
- ***Optional: The Web*** food web activity (a printable copy is on the RiverXchange Curriculum Page).

Vocabulary

- **Ecosystem:** All the living and nonliving things that interact in a particular place.
- **Bosque:** A Spanish word for woodlands, it refers to the riparian areas of stream and river banks in the southwestern US.
- **pH:** A measure of the acidity or alkalinity of water (or a solution) on a scale that ranges from 0 (extremely acidic) to 14 (extremely alkaline). Pure water has a pH of 7 (neutral).
- **Turbidity:** A measure of water clarity based on the amount of particles suspended in it.
- **Dissolved oxygen:** The concentration of oxygen dissolved in water, expressed in milligrams per liter or as a percent saturation.
- **Riparian area:** The area around the banks of a natural body of fresh water, where the vegetation and landscape is directly influenced by that water.
- **Aquatic macroinvertebrates:** Animals that have no backbone, are visible with the naked eye, and spend all or part of their life in water. This diverse group includes worms, mollusks, arachnids, crustaceans, and insects.
- **Food web:** A representation of the predator-prey relationships between species within an ecosystem.
- **Producers:** Organisms, generally plants, that make their own food (using only the sun's energy, water, and inorganic compounds), and are the foundation of the food chain.
- **Consumers:** Organisms that obtain nutrients by eating other organisms (such as plants or other animals).
- **Decomposers:** Organisms (such as bacteria, fungi, other plants and animals) that break down the remains of dead organisms, releasing the substances that can be used by other members of the ecosystem.
- **Native species:** A species that naturally occurs in a particular ecosystem.

- **Invasive species:** A plant or animal introduced from a different area that competes with native species that is taking over an area.
- **Endangered species:** A plant or animal species existing in such small numbers that it is in danger of becoming extinct (dying out completely).

Appendix 2

Extension Questions and Activities

Field Trip:

Extension Activities:

- Write a *narrative* paragraph or a *friendly letter* to your partners, or create another type of project, about your field trip: Explain how your project will help the river ecosystem and what you learned. Describe what was difficult for you on the field trip and what was enjoyable.

- Make a food web for your local ecosystem, identifying producers, consumers and decomposers, native species and invasive species, as well as local endangered species . Discuss how wildlife are "water users" too. Like humans, wildlife needs clean water to live, so as a community we must consider their needs when making choices about water. Use Bosque plant and animal cards to do *The Web* activity (a printable copy is on the RiverXchange Curriculum Page), discussing how all living things depend on each other.

- Learn about The STRAW Project. An ongoing watershed restoration project first inspired by 4th graders in 1992, based in Marin Co. California! Add it to your school's library and show the documentary in class. http://www.pointblue.org/our-science-and-services/conservation-science/conservation-training/straw-program or read about the project in this article and discuss: http://www.marinij.com/article/NO/20150325/NEWS/150329872

Reflection Questions:

- What did you learn about the history of the Rio Grande River and the floodplain we planted in? How does this history impact the future of cottonwoods in the area?
- Identify some common invasive species. Where did they come from and how are they impacting the Bosque?
- What is the process of planting cottonwoods and willows and why do we do it in the wintertime?
- After this field trip, how may you see and understand the Bosque differently?
- What did you most enjoy being down in the Bosque?
- How can you apply what you learned or enjoyed on your field trip in your everyday life?

Stormwater:
Extension Activities:
For a math extension activity try the “Does it Soak Right In?” lesson
“Don’t Trash Our Rio!” is another great extension activity for this presentation. That activity sheet can be found in your RX welcome folder.

You can also review the “Top Ten Ways To Protect Our Precious Water” handout in your teacher packet or within the Project 2 section on the curriculum webpage.
Here you can zoom in and explore your watershed and the watershed that family and friends live in, perhaps even your RiverXchange partners who live outside of New Mexico!:

Interactive Topographical Watershed Map of Earth

Reflection Questions:
● What is stormwater and where does your community’s stormwater go?
● What did you learn about stormwater that was surprising to you?
● How does what happens in your yard or your neighbor’s yard impact the watershed?
● What have you noticed about stormwater in your own neighborhood? What are things you can do to clean up stormwater?
● How can surface water become polluted?
● What’s happens when rain falls on a pervious surface compared to an impervious surface? Give examples of impervious surfaces.
● How are groundwater and surface water connected?
● What are ways you can minimize stormwater pollution?
● What role do forests and wetlands play in a watershed?

Wastewater:

Extension Activities:

Through the ABQ Water Utility Authority's website you can navigate virtually through Albuquerque's wastewater system: http://www.abcwua.org/Education/SWRP_home.html or the overall water system:http://www.abcwua.org/education/el_WSD_2.html
Want to add a project-based learning component to this exercise? Use these questions and activities to go along with your tour:
http://www.abcwua.org/education/educators_WSDcur2_quest.html
Maybe even create a PSA with your class inspired by all you've learned!

Discuss what kinds of things NOT to put down the drain or toilet – for example, fats, oils, and grease can solidify in pipes and cause a backup. Discuss how treated wastewater is recycled in many communities (such as watering golf courses), and how a community's treated wastewater will be used by downstream communities.

Watch one of these videos in class to review the process of wastewater and what students can do to take care of wastewater:
-https://www.youtube.com/watch?v=Ldz29NqwK78 (An animation narrated by a young student)
-https://www.youtube.com/watch?v=tuYB8nMFxQA (A video on the water treatment process created by New Jersey American Water)

Reflection Questions:

- What is wastewater and how does it impact your community?
- What is the difference between wastewater, stormwater and drinking water?
- How can you use what you've learned to make a difference at home and at school?
- What is the process of treating wastewater in your community?
- What surprised you about the process of treating wastewater from the presentation?
- Since our wastewater gets cleaned and recycled at the wastewater treatment plant, why is it important to do what we can to keep it clean before it arrives there?

Drinking Water:
Extension Activities:

-Create a filter in class to clean contaminated water and investigate your findings with this lesson. This can be done over the course of a few days in class or you can demonstrate how a filter works with our class in a shorter lesson.: http://seplessons.ucsf.edu/node/1754

-A short article and video comparing the average consumption of water per day per person in Africa compared to in the U.S.
https://www.awf.org/blog/how-does-water-use-united-states-compare-africa

-A great lesson, learning about the issue of water scarcity and importance of conservation. Students log their personal use of and observation of water use over two days. Students can discuss their findings and talk about what would happen if water scarcity were an issue. There is also a TRUE/FALSE game to learn about water and how it impacts the human body and communities. https://thewaterproject.org/resources/WaterLogs_5to8.pdf

Reflection Questions:

- Where does your drinking water come from and what communities rely on it?
- Drinking water is used for much more than bathing, flushing toilets and drinking. What are other ways you and your community use drinking water? Did you learn anything surprising about how we use drinking water, if so - what?
- What percentage of the Earth is covered in water? Out of that amount, how much is accessible fresh water? How much is available as drinking water and why is it important to conserve it?
- One-third of the world's population does not have access to clean drinking water. How would your life be different if you had to walk miles to bring back water to your family?

Agriculture:

Extension Activities:

To explore more about the Dust Bowl with your students: http://www.pbs.org/kenburns/dustbowl/educators/overview/

Out of the Dust- Karen Hesse (This book is in the voice of 14 year old Billie Jo. She narrates her struggle to help her family in the years of the Depression from the Dust Bowl. Takes place in Oklahoma, written as a poem. This book helped me fall in love with reading when I was in 5th grade!)

Extension activity: Interview a grandparent or an adult friend who knows about the Depression through personal experience or through stories told by their parents and relatives. Share with class members.

Soil is Not Trivial lesson plan

Reflection Questions:

- What was the Dust Bowl and how did it impact people?
- What do you think are the major agricultural lessons for us from the Dust Bowl?
- How may we be able to prevent a dust bowl from occurring?
- What is important for farmers to consider when planning how to irrigate their farm and why?
- How does agriculture relate to water and to our daily lives?
- What did you discover in your planting activity about the different types of irrigation?

Appendix 3

Photos

Exhibit 4
B.E.M.P. 2017-2018

The University of New Mexico
Department of Biology
MSC03 2020
Albuquerque, NM 87131
505.277.0758

Bosque Ecosystem Monitoring Program

BOSQUE SCHOOL
scholarship • community • integrity
BEMP Education Office
4000 Bosque School Road NW
Albuquerque, NM 87120
505.898.6388

Bosque Ecosystem Monitoring Program (BEMP)
2017-2018 Stormwater Science Education Overview

The main objective of the *Stormwater Science* outreach education program is to teach students that the health of the Rio Grande is directly correlated to the health of the surrounding watershed. BEMP educators have developed a *Stormwater Science* program that includes a 90-minute classroom activity, a four- to five-hour study trip to the Rio Grande, and an optional water chemistry lab during which students gain an understanding of the complex system. **During the 2017-2018 school-year 2247 students participated in *Stormwater Science*** activities in their classrooms, in the field or both. The classroom program was delivered to **1517 students** in **30 classrooms** at **19 different schools** in **Rio Rancho, Albuquerque, and Belen.**

The *Stormwater Science* program targets middle school and high school students using two main formats: an indoor classroom lesson and an outdoor field experience or "study trip."
The principal objective for the classroom portion of the program is to demonstrate how some of our daily (individual) actions impact the health of the Rio Grande. To reach that goal, students construct a model of the Rio Grande Watershed (see Page 6) under different scenarios. The model watershed has five different communities along the river: a cattle ranch, up-and-downstream eco-friendly towns, an urban city, and agricultural fields. Students add different „runoff cards‟ to the river downstream of the community where the runoff constituents originate. Some of the runoff is naturally occurring (e.g. turbidity) while other is human caused (e.g. pesticides or oil). The model runs through two different scenarios: (1) a *before-the-storm* and (2) an *after-the-storm*. These two versions of a watershed demonstrate the harmful effects storm water contamination can have on aquatic organisms and downstream communities.
At a broader scale, the classroom program encourages students to be reflective about their daily behaviors and to think about ways they can help keep their watershed clean. Students are asked to brainstorm ways they can help improve watershed health before educators lead a discussion on watershed stewardship that aligns with the MRGSQT educational messaging. Further, in order to reach students that identify Spanish as their first language and better capture New Mexico‟s students diversity, the handout for this activity is available to students in both English and Spanish (classroom handout is included on page 4of this document).

The main goal for the study trip is to build upon the themes of the classroom presentation and to provide a hands-on experience in water quality testing at the river. This section consists in a four to five hour trip to the Rio Grande during which students investigate how stormwater moves through the city and what it carries with it. Further, students get to collect and interpret water quality data to better understand the subject. The program starts with an arroyo survey which examines and categorizes the amount of visible pollutants (e.g. plastics, paper, dog poop, animal scat, etc.) in the San Antonio arroyo in Albuquerque, which drains to bosque. In the arroyo, students survey for several types of litter and test water quality using a LaMotte water quality monitoring kit (see Page 6). When the students arrive at the bank of the Rio Grande, they do additional water quality testing and search for macro-invertebrates. Students then collectively share their results, compare them to results they gathered in the arroyo, and discuss what the data could mean in terms of river health. This section of the curriculum allows students to have a more hands-on learning experience.

One of the challenges for middle and high school participation in programs like Stormwater Science is that teachers are only able to bring a subset of students into the field, while the rest remain at school with a substitute teacher. In order to reach more middle and high school students and provide another educational opportunity outside of the classroom, BEMP has offered a water chemistry lab during the 2016-2017 and 2017-2018 school-years. As an alternative to the conventional study trip, BEMP hoped the lab would accommodate some of the teachers‟ restrictions and provide an opportunity for hands on water testing. Very few teachers chose the lab option and generally expressed more interest in the study trip. In the future, BEMP does not plan to offer at water chemistry lab option to teachers except by special request.

During the 2017 fall semester, BEMP developed a new *Watershed Ecology* activity to use at events like our end of year Student Congress. This new activity follows the teaching objectives of *Stormwater Science*, but students collect data in a made up watershed to discover how runoff affects life in the river. Educators piloted the activity at the 2017 Rio Rancho Children‟s Water Festival and plan to use it at similar events in the future.

Hundreds of students also took part in *Stormwater Science* related field activities at three BEMP events this year. The BEMP Student Congresses (approximately 250 students and 45 teachers and chaperones), where BEMP students had the chance to share their research and experiences in the bosque, including watershed health observations; BEMP‟s Otter Day (approximately 200 students and 75 teachers and chaperones), an event for first graders, hosted by high school students to teach about endangered animals in New Mexico (see Page 7); BEMP also co-hosts the annual Sevilleta-Luquillo Virtual Symposium with Luquillo Long Term Ecological Research Site in Puerto Rico, where approximately 50 students from both sites present their research in Spanish. This year many of our Albuquerque students chose to present on the topic of watershed health. During June and July BEMP partners with Horizons Albuquerque, students learn about the many different ways in which scientists collect data about the environment, including water chemistry techniques in the Rio Grande and how their results are connected to storm events.

English Classroom Handout – Mid/High School

Hydrologist: ____ Date: ______________________

Stormwater Science

What 2 sources can New Mexicans get their drinking water from?

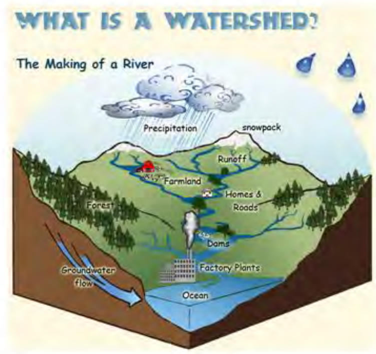
1. ____________________

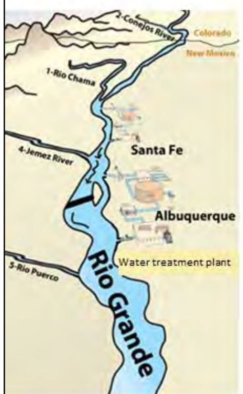
2. ____________________

Where does water go after we use it?

____

A *__watershed__* is an area of land where all of the water that falls on it, or that is under it, drains to the lowest point.





Draw a line from the word to its definition

Turbidity	♦ A stream or arroyo that brings water to the main channel of the river
Nonpoint source pollution	♦ Types of nutrients found in fertilizers that can lead to excess algae growth
E.coli	♦ A single location where pollution is being leaked into the environment
Point source pollution	♦ A type of *bacteria* found in warm blooded animal's intestines that can make people sick
Nitrates and phosphates	♦ Tiny 'water bugs' whose species are an indication of water quality
Tributary	♦ *Any* type of pollution that comes from *many different* sources
Macro-invertebrates	♦ A measure of water clarity based on the amount of suspended solids

Page 1

Cattle Ranch

Upstream eco-friendly town

Farm Fields

How do the living things in the river ecosystem react to the stormwater?

____

____

____

____

____

Stromwater carries runoff and pollution from every part of the watershed to the river. List some types of runoff that come from natural areas.

____

____

____

List some types of runoff that come from your community:

____

____

____

____

____

____

City

Downstream eco-friendly town

How can *YOU* help to keep our watershed clean?

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________

Page 2

Spanish Classroom Handout – Mid/High School

Hidrólogo/a: ______________________________ Fecha: ______________

Ciencia detras una tormenta

Cuales son las dos fuentes de agua de donde los Nuevo Mexicanos sacan el agua para beber?

1. ______________

2. ______________

A donde va el agua despues de usarla?

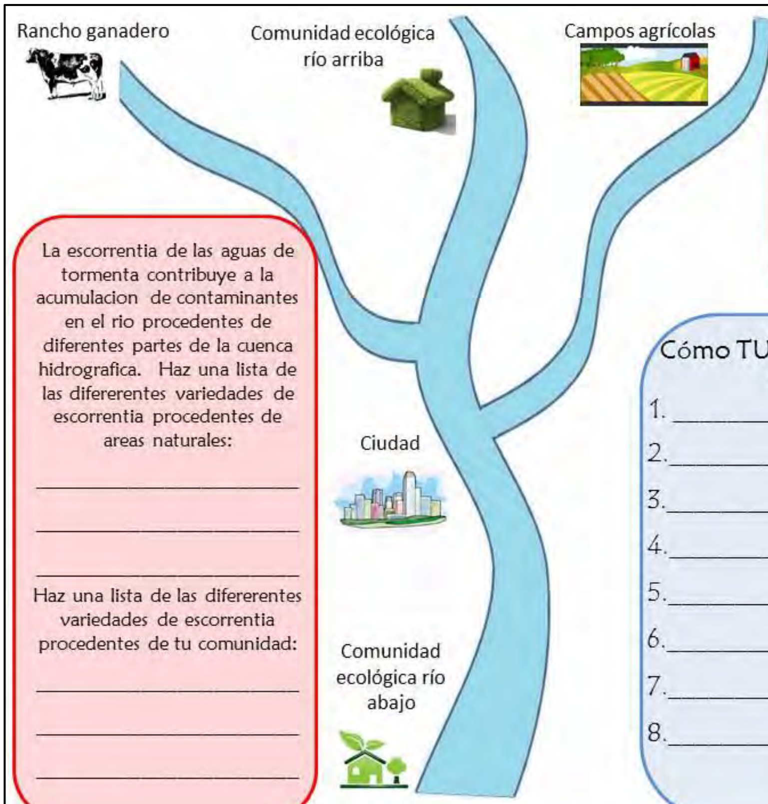
____

Una *cuenca hidrografica* es el territorio drenado por un unico rio, delimitado por montanas.

Conecta las palabras con su definicion

Turbidez	• Corriente de agua que desemboca en un río mayor o directamente al mar.
Contaminacion difusa	• Tipologia de nutrientes que se encuentran en los fertilizantes y que pueden causar crecimiento algal excesivo.
E.coli	• Contaminacion de un solo origen.
Contaminacion focal	• Tipologia de bacteria que se encuentra en el aparato digestivo de animales de sangre caliente. Cuando se ingiere, puede causar/traer enfermedad.
Nitratos y fosfatos	• Pequenos insectos aquaticos que pueden ser usados como indicadores de la calidad del agua.
Tributario o afluente	• Contaminacion de origen diverso.
Macro-invertebrados	• Medida del grado de transparencia del agua que depende de la cantidad de particulas en suspension.

Page 1



Como reaccionan los elementos vivos del ecosistema de rivera a la escorrentía?

____
____
____
____
____

La escorrentia de las aguas de tormenta contribuye a la acumulacion de contaminantes en el rio procedentes de diferentes partes de la cuenca hidrografica. Haz una lista de las difererentes variedades de escorrentia procedentes de areas naturales:

____
____
____

Haz una lista de las difererentes variedades de escorrentia procedentes de tu comunidad:

____
____
____

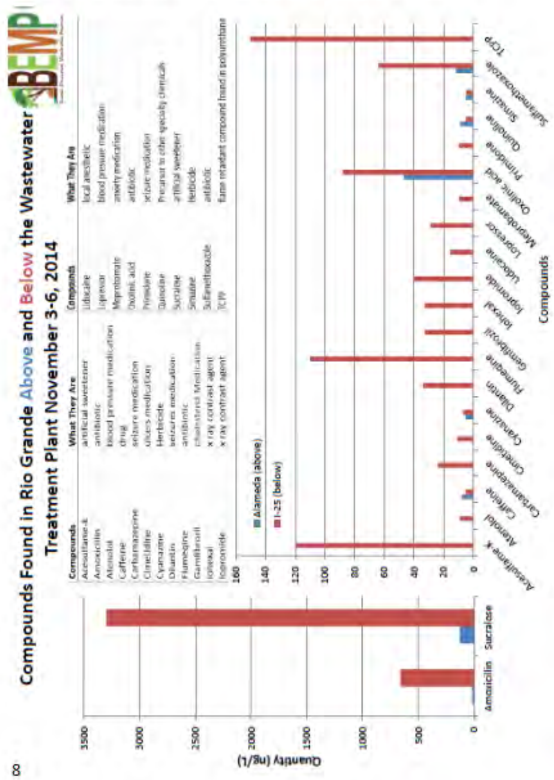
Cómo TU puedes ayudar a mantener la cuenca limpia?

1. ______________
2. ______________
3. ______________
4. ______________
5. ______________
6. ______________
7. ______________
8. ______________

Page 2

Field Journal for outdoor study trips

Do you use any of these compounds?



8

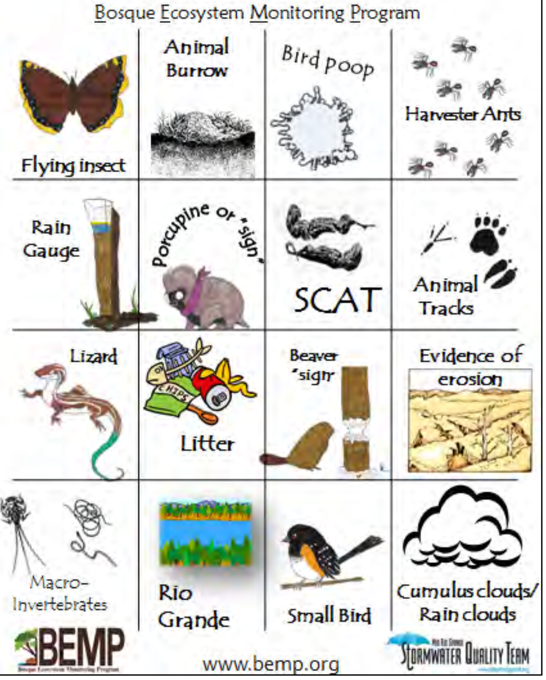
Name:_______________________________

Date:_______________________________

Stormwater Science

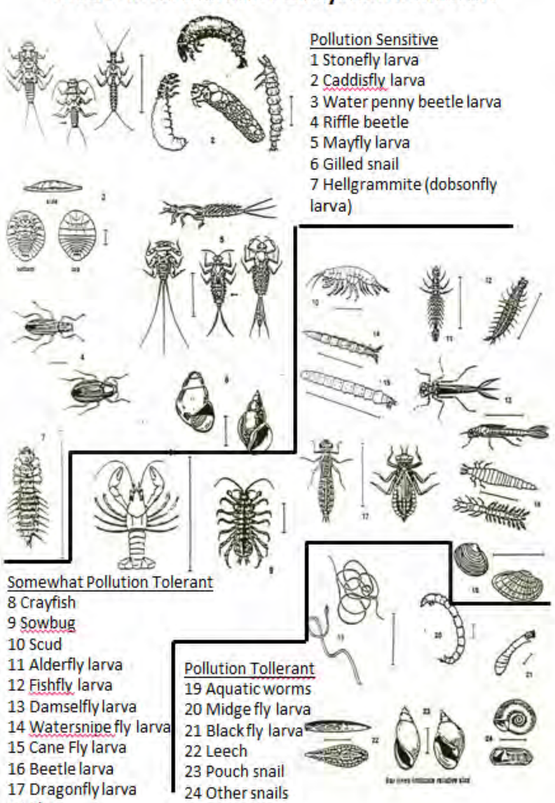
Field Journal

Bosque Ecosystem Monitoring Program



www.bemp.org

Macro-invertebrates: Ecosystem Indicators



Pollution Sensitive
1 Stonefly larva
2 Caddisfly larva
3 Water penny beetle larva
4 Riffle beetle
5 Mayfly larva
6 Gilled snail
7 Hellgrammite (dobsonfly larva)

Somewhat Pollution Tolerant
8 Crayfish
9 Sowbug
10 Scud
11 Alderfly larva
12 Fishfly larva
13 Damselfly larva
14 Watersnipe fly larva
15 Cane Fly larva
16 Beetle larva
17 Dragonfly larva
18 Clam

Pollution Tollerant
19 Aquatic worms
20 Midge fly larva
21 Black fly larva
22 Leech
23 Pouch snail
24 Other snails

Litter Survey

The San Antonio Arroyo collects runoff from all over the west side of Albuquerque, anything on the streets can end up in the arroyo. Record the litter you find throughout the day here.

Litter type	Arroyo	Bosque
Plastic		
Paper		
Glass		
Metal		
Cigarette butts		
Dog poop		
Animal scat		
Evidence of chemicals		
Other trash		

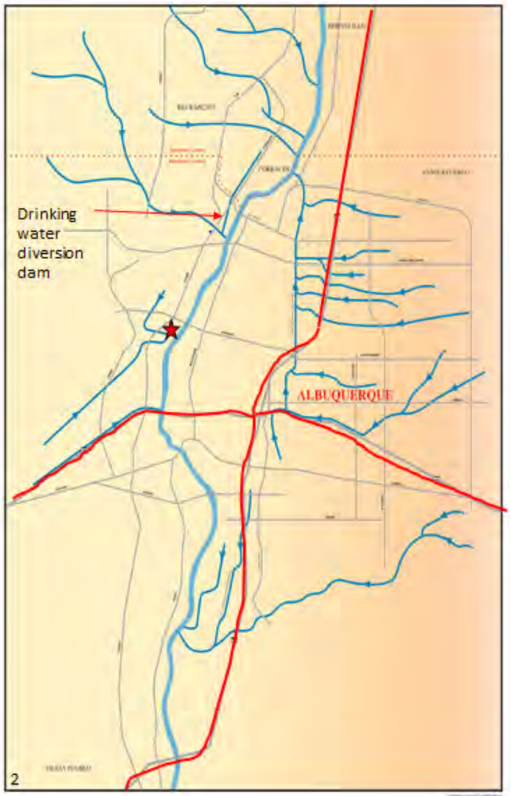
Who is responsible?

Point source pollution- comes from a specific place

Non-point source pollution- comes from many places and people

3

Field Journal for outdoor study trips (cont.)



Water Chemistry

	Arroyo	River
Temperature	°F / °C	°F / °C
Turbidity	JTU	JTU
Nitrate	ppm	ppm
Phosphate	ppm	ppm
pH		
Dissolved oxygen	ppm %	ppm %
E. coli	Present / Absent	Present / Absent

Temperature
8-12 °C- good
13-15 °C- fair
>15 °C- poor

Turbidity
Sources: erosion, fire
1-39 JTU- good
4--100 JTU- fair
>100 JTU- poor

Nitrates
Sources: plants, soil, fertilizer
1-4 ppm- good
5- 20 ppm- fair
>20 ppm- poor

Phosphates
Sources: plants, fertilizer, plastic
1 ppm- good
2 ppm- fair
4ppm- poor

pH
1-strong acid- poor
6-weak acid- fair
7-neutral- good
8-weak base-fair
14-strong base-poor

Dissolved Oxygen
1 ppm or 60-100% -good
4 ppm or 40-60%- fair
8 ppm or 0-40%- poor

E. coli
Sources: animal waste
E.coli will always be present in small amounts. Large amounts are harmful to humans and animals

Overall river health: (circle one)

Good Fair Poor

How long will it take?

Every piece of trash has a face… where and WHO did it come from? It takes just a moment for an item to be carelessly discarded where it can be washed into a river or blown in by wind, but it can take many, many years for it to completely decompose. Test your knowledge about decomposition times below by drawing a line from the item to its decomposition time.

Banana peel	1 million years
Cigarette butt	600 years
Fishing line	450 years
Styrofoam cup	200 years
Milk carton	50 years
Plastic bottle	20 years
Aluminum can	5 years
Glass bottle	3 months
Plastic bag	4 weeks

Which of these things can be reused or recycled?

____

____

____

Weather Report

1. Time: _____________ am or pm
2. Today's Weather:

3. Cloud Cover: ___________ %

4. Wind: Speed: ___________ Direction:
km/hr OR mph
5. Humidity: ____________ %
6. Temp: It feels like: _______ °F It actually is.... ________ °F

Journal Space

Middle school students at Cien Aguas International School (top right). In the field middle school students look for evidence of pollution in San Antonio Arroyo (center right) and study water quality through macro-invertebrates (bottom right). 1st grade students complete a puzzle to find the "secret messages" about protecting river habitats at Otter Day (below)

2017-2018 Stormwater Science Education Outreach Numbers

Date	Teacher	School	City	# students in classroom	# students in Field or Lab	# adults	Grade	Activity	# Presen-tations	Hours	School Level
8/16/2017		Amy Bielh HS	Albuquerque		18	2	9th	Study trip	1	1	HS
9/13/2017		Amy Bielh HS	Albuquerque		24	2	9th	Study trip	1	1	HS
10/6/2017	Sondra Lawson	Garfield STEM Middle School	Albuquerque		25	2	6th	Study trip	1	4	MS
10/23/2017		Rio Rancho Water Festival	Rio Rancho	149		28	4th	Event	6	3	ES
10/24/2017		Rio Rancho Water Festival	Rio Rancho	130		25	4th	Event	6	3	ES
11/1/2017		Amy Bielh HS	Albuquerque		24	2	9th	Study trip	1	1	HS
11/6/2017	Velia Raff	Cien Aguas International School	Albuquerque	60		2	6th	Classroom	2	2	MS
11/17/2017	Sondra Lawson	Garfield STEM Middle School	Albuquerque	85		1	6th + 7th	Classroom	3	3	MS
11/29/2017		Amy Bielh HS	Albuquerque		20	2	9th	Study trip	1	1	HS
12/4/2017	Selena Shepherd	Monte Vista Elementary	Albuquerque	25		1	5th	Classroom	1	1.5	ES
12/4/2017	Lisa Vargas	Monte Vista Elementary	Albuquerque	30		2	5th	Classroom	1	1.5	ES
12/4/2017	J. Romero, B. Delanoy	San Felipe de Neri	Albuquerque	24		1	5th	Classroom	1	1.5	ES
12/7/2017	J. Romero, B. Delanoy	San Felipe de Neri	Albuquerque		24	5	5th	Study trip	1	4	ES
12/8/2017	Selena Shepherd	Monte Vista Elementary	Albuquerque		25	2	5th	Lab	1	1.5	ES
12/8/2017	Lisa Vargas	Monte Vista Elementary	Albuquerque		30	2	5th	Lab	1	1.5	ES
12/8/2017	Larissa	Monte Vista Elementary	Albuquerque	30		2	5th	Classroom	1	1.5	ES
12/6-14/2017	Kari Daniels	Bosque School	Albuquerque	85		1	8th	Classroom	4	6	MS
1/10/2018	Alicia Ruch-Flynn	Albuquerque Institute of Math and Science	Albuquerque	50		1	7th	Classroom	2	3	MS
1/10/2018	Beverly Miller	Albuquerque Institute of Math and Science	Albuquerque	25		1	7th	Classroom	1	1.5	MS
1/31/2018	Jennifer Moss	Tony Hillerman Middle School	Albuquerque	20		1	7th/8th	Classroom	1	1.5	MS
2/6/2018	Suzy Dunnam	Jefferson Middle School	Albuquerque	75		1	7th	Classroom	5	5	MS
2/6/2018	Kathleen Nubar	The international School at Mesa del Sol	Albuquerque	25		1	8th/9th	Classroom	2	2	MS
2/8/2018	Kathleen Nubar	The international School at Mesa del Sol	Albuquerque		20	2	8th/9th	Study Trip	1	4	MS
2/12/2018	Elizabeth Landsford	Bandelier Elementary	Albuquerque	25		1	3rd	Classroom	1	1	ES
2/12/2018	Susan Fuller	Bandelier Elementary	Albuquerque	25		1	3rd	Classroom	1	1	ES

2/12/2018	Sarah Campbell	Bandelier Elementary	Albuquerque	26		2	3rd	Classroom	1	1	ES
2/12/2018	Lea Lahasa	Bandelier Elementary	Albuquerque	26		2	3rd	Classroom	1	1	ES
2/13/2018	Mary Erwin	Wilson Middle School	Albuquerque	145		1	6th	Classroom	5	5	MS
3/6/2018	Katelin Fischer	Ace Leadership High School	Albuquerque	15		1	10th	Classroom	1	1.5	HS
3/15/2018	Katelin Fischer	Ace Leadership High School	Albuquerque		15	2	10th	Study trip	1	4	HS
4/2/2018	Ashley Webb	Dolores Gonzales Elementary	Albuquerque	25		1	4th	Classroom	1	1	ES
4/2/2018	Carmen Lopez-Gaston	Dolores Gonzales Elementary	Albuquerque	18		1	4th	Classroom	1	1	ES
4/2/2018	Hilda Alvarez	Dolores Gonzales Elementary	Albuquerque	18		1	4th	Classroom	1	1	ES
4/3/2018	David Tichnell	Holy Ghost Catholic School	Albuquerque	26		1	6th	Classroom	1	1	MS
4/5/2018	David Tichnell	Holy Ghost Catholic School	Albuquerque		26	2	6th	Study trip	1	4	MS
4/9/2018	Rona Gomez	Georgia O'Keeffe Elementary	Albuquerque	27		1	5th	Classroom	1	1	ES
4/10/2018	Rona Gomez	Georgia O'Keeffe Elementary	Albuquerque	108		4	5th	Classroom	4	4	ES
4/23/2018	Holly Riviera	Holy Ghost Catholic School	Albuquerque	25		1	5th	Classroom	1	1	ES
5/9/2018	Carol Blackshear	Del Rio Academy	Belen	15		5	4th-6th	Classroom	1	1	MS
5/9/2018	Eric	Del Rio Academy	Belen	15		5	6-8th	Classroom	1	1	MS
5/10/2018	Robert Jones	Harrison Middle School	Albuquerque	165		5	6th	Classroom	5	5	MS
4/11/2018	BEMP	Otter Day	Albuquerque		103	33	Kinder/1st	Event	6	2.5	ES
4/16/2018	BEMP	Otter Day	Albuquerque		104	41	1st	Event	6	2.5	ES
4/25/2018	BEMP	BEMP Congress	Bernalillo		150	30	7th-12th	Event	38	4	MS + HS
4/27/2018	BEMP	BEMP Congress	Albuquerque		100	15	4th-6th	Event	25	4	MS
5/25/2018	BEMP	LTER Virtual Symposium	Albuquerque		34	12	6th-12th	Event	10	2.5	MS + HS
6/11/2018	BEMP	Horizons Albuquerque	Albuquerque		15	3	8th	Study trip	1	2	MS
6/26/2018	BEMP	Horizons Albuquerque	Albuquerque		15	3	6th	Study trip	1	1	MS
Total #'s				1517	730	259			159	107	

Exhibit 5
Nature Conservancy 2017-2018

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Protecting nature. Preserving life.

New Mexico
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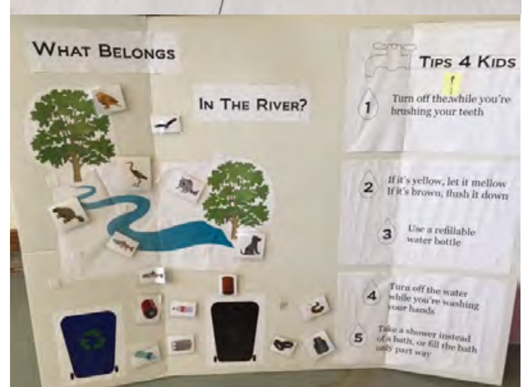
Santa Fe, New Mexico 87501

Tel (505) 988-3867 nature.org/newmexico
Fax (505) 988-4095

The Nature Conservancy in New Mexico
Urban Conservation Educational Programs
Final Report to the City of Albuquerque: June 2018

In 2018, The Nature Conservancy engaged some specific communities, including an under-resourced area, with education/awareness programs focused on stormwater pollution emphasizing nature-based solutions. Our education program reached both adults and youth with hands-on, outdoor learning activities about stormwater impacts on the Rio Grande, how Albuquerque residents can reduce stormwater pollution, and the role of infiltration and the use of trees and other vegetation to clean our air and water. We reached approximately 100 adults and 250 children with our water messages and an additional number of people with earned media from articles featured in the Albuquerque Journal and Alibi.



Youth Education Programs:
In April, we conducted two Earth Day events connecting with students from all over Albuquerque. One event at a local Title I school, in the Barelas neighborhood included children from kindergarten through 5th grade. Activities ranged from planting a school garden, making native plant seed balls (seed bombs), soil filter experiment, stormwater bingo and learning about rainwater catchments. Other activities included a hands-on game board called "What Belongs in the River?" which was a fun way to engage younger students in understanding stormwater pollution sources. We also piloted the "Conservation Classroom" by providing curriculum on water conservation to over 100 elementary students.

A second event was hosted at Sandia Lakes for about 150 special-needs students and their families (75 adults). Students were primarily from Albuquerque Sign Language Academy, plus special-education students from various schools throughout Albuquerque Public Schools (APS) system. Participants, both youth and adults, participated in similar hands-on activities and watershed based educational curriculum. Topics included stormwater management, water quality, watershed connections, the importance of forests and mountains as water towers, drinking water sources, impacts of drought, and ecological consequences of river management.

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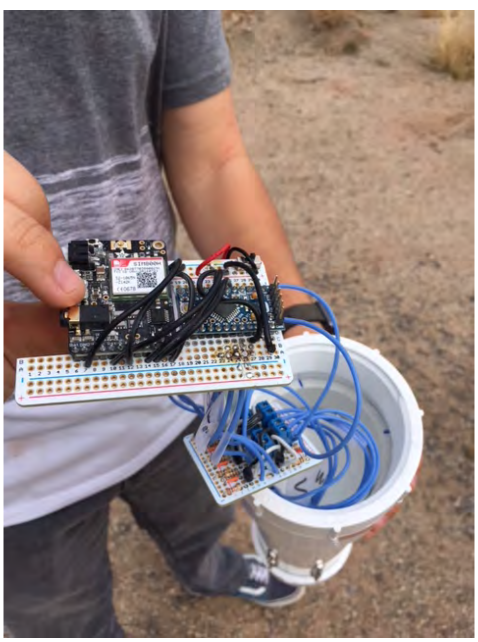
We have also engaged eight Rocky Mountain Youth Corp members, ages 17-25, in activities to learn about trees and how stormwater could serve as an asset to building a more robust tree canopy in Albuquerque. Crew members assisted with taking an inventory of and assessing the health of trees in city parks and street trees to help us understand where the gaps in tree canopy are, which trees do the best in our urban setting and identifying locations where stormwater could benefit street trees.

Finally, we participated in an afterschool program at NexGen Academy focused on technology, where students learned about stormwater management and produced a device to measure soil moisture. Using an Arduino, a small programable computer chip, the students developed a field unit that could be placed along an arroyo, acequia or small canal to measure soil moisture to inform the appropriate biofiltration plants that area could support. The unit is water tight, to be able to handle natural weather and transmits the data to a google spreadsheet in real time. It also has four sets of sensors to measure soil moisture at various depths. We worked with the students to help them understand rainfall totals, stormwater management including the types of arroyos and other channels that are used to carry stormwater, the concept of biofiltration and how it works, as well as the reasons behind why this type of data is important and how it could be used. The students diligently worked on their prototype and won first place in the State MESA competition and are competing this week in the National finals.



Adult Education Programs:
In March, we hosted a volunteer day to install 2,500 gallons of rainwater storage capacity at Dolores Gonzales Elementary School in Barelas. This installation brought in additional support from General Mills and their employees, who volunteered to install the barrels at the school. It was a great day and they made short work of the installation. We also had a volunteer who created a video of the day, which can be found here: https://vimeo.com/260859979.

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As well, we engaged three neighborhood associations near Tijeras Arroyo through a watershed health forum to discuss stormwater management, sources of pollution and how residents can reduce their contributions. We will continue to work with these neighborhoods to help them address their local issues. Related to this, the Arid LID Coalition has doubled in the number of active members participating in our bi-monthly meetings. The group has targets for stormwater education and outreach as a primary goal for this year and we are in the process of developing a short (1-2 min) video about green stormwater infrastructure and the role it plays in arid environments. We expect the video to be released during the EPA Region 6 Stormwater conference in August. Additionally, we have engaged a small group of residential and commercial developers to understand how we might overcome barriers to the adoption of green stormwater infrastructure techniques.

Tijeras Creek is an important tributary of the Rio Grande and with its recent TMDL limits, it is an area of active restoration. The Conservancy has continued to participate in this Watershed Collaborative, which is addressing all parts of the watershed from high in the Sandias to the River. Projects such as the Cedro Restoration Project at the Cedro Creek headwaters and the Rocky Mountain Youth Corp project, funded by the Rio Grande Water Fund, which is restoring 3-4 miles of Cedro Creek, will improve conditions to reduce erosion, improve water infiltration and potentially reduce the flow of contaminants into the City's jurisdiction.

Finally, we have engaged with two local experts to develop a plant list of trees and shrubs that are suitable for five elevational transects crossing the city. These selected species account for drought tolerance, water requirements, temperature limits, invasiveness, wildlife habitat and other attributes that make them good selections for our arid City.

Marketing and Communications:
During the time of the Conservancy's contract with the city, we disseminated a media advisory about urban conservation outreach activities, which was pitched to regional media outlets (see attached). Two local newspaper outlets, The Albuquerque Journal and the Alibi produced stories about stormwater management and our education efforts. In total, between February and June, 14 stories appeared about urban conservation initiatives reaching 4.68M online and 206,000 via broadcast. These stories have a total publicity value of $16,000.

Additionally, a volunteer produced a video about the rainwater catchment project, which was disseminated through social media tools and received wide distribution through one of our partners, General Mills (see link on page 2). As well, all media coverage and releases are highlighted on the Conservancy's website and Facebook page. These educational programs were also featured in the Conservancy's spring State Director's Letter, which included a quote from Kevin Daggett, reaching more than 8,000 households in New Mexico and was distributed to 3,000 individuals through our Great Places e-newsletter.

Highlighted stories include:
June 14
http://www.koat.com/article/nature-conservancy-trains-kids-how-to-prevent-tree-loss/21351290

June 13
http://www.krqe.com/news/albuquerque-metro/students-take-part-in-annual-tree-trimming/1234185842

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April 19
https://alibi.com/feature/55803/Healthy-Plants-Healthy-Kids.html

April 19 - ABQ Journal Home Style section
http://www.pressreader.com/usa/albuquerque-journal/20180420/282948155827883

April 5
https://www.bizjournals.com/albuquerque/news/2018/04/04/nature-conservancy-opens-albuquerque-office.html?anae_ae_set1&sarticle_du&ed2018-04-04&uBTJH4DWHKt2BFfqH0OBRBLQ000b4250&t1522881870&j80857241

Exhibit 6
EarthForce 2017-2018

TO: Kathy Verhage, City of Albuquerque
FROM: Vince Meldrum
DATE: Wednesday, October 3, 2018
RE: Earth Force Progress Report/Invoice

Thank you again for your ongoing support of Earth Force. We are happy to report that we are making substantial progress toward the goals outlined in our contract with the City of Albuquerque.

Our contract outlines benchmarks in three areas: Educator Training; Volunteer Engagement/Training; and, World Water Monitoring Day. As of the end of September we have made substantial progress in each category. Please accept the following as an interim report on our progress.

Goal 1: Train 10 Educators
To date we have identified 12 educators who will be working with Earth Force this year. Of that number six received training in September two received training in the Spring of 2017, and four will be working under the umbrella of an experienced educator at Truman Middle School (will not require training). The following is a list of educators working with Earth Force during the 2017/2018:

<u>Isleta Middle School:</u>
* Loretta Ortiz - 6th Grade Teacher
* Christine Nieto - 6th Grade Teacher
* Janelle Armijo - 5th Grade Teacher
* Rebecca Vesely - Principal

<u>Truman Middle School:</u>
** Lynn Schuler - MS Teacher/MESA Leader
Michael Pedersen - MS Teacher
Jesse Winter - MS Teacher
Cilian Perez - MS Teacher
Nicholas Kadlec - MS Teacher

<u>Native American Community Academy (NACA):</u>
** Charlene Lucero - 6th and 7th Grade Science Teacher
* Tylar Rodriguez - HS Chemistry and Physics
* Rob Salazar - 7th and 6th Grade Science Teacher

** Trained in September 2017*
*** Trained Prior to September 2017*

Goal 2: Engage 7 Volunteers

Earth Force engages volunteers who support students and educators as they progress through the Earth Force process. So far, this year Earth Force has identified and has begun the process of preparing volunteers from the following organizations:

- Bureau of Indian Affairs (BIA)
- U.S. Fish and Wildlife Service,
- Sandia Pueblo Environment Department
- Isleta Pueblo Environment Department
- Bosque Ecosystem Monitoring Program (BEMP)
- Intel

Goal 3: Prepare for World Water Monitoring Day
As of the end of September we had planned two events to commemorate World Water Monitoring Day. First, we planned to host students from Truman Middle School at the Valle de Oro Urban Refuge on September 20, 2017 (that event has subsequently taken place). Second, we began working with NACA to host students for a water monitoring event at Valle de Oro (we are still finalizing a date for that event).

Mid Rio Grande Stormwater Quality Team
www.keeptheriogrand.org

Outcomes Report

for

Fiscal Year 2017-2018

(July 1, 2017 - June 30, 2018)

presented by

Phyllis Baker

cwa STRATEGIC COMMUNICATIONS

During the period from July 1, 2017 through June 30, 2018, the Mid Rio Grande Stormwater Quality Team (MRGSQT) continued its educational partnerships with the Bosque Ecosystem Monitoring Program (B.E.M.P.) and RiverXchange. The team continued to post relevant information to its website and Facebook page, and also participated in a number of high-profile community events, including the Corrales Harvest Festival, New Mexico's Animal Humane Society's Doggie Dash and Dawdle, and the KOB TV Health & Wellness Fair. The team's interactive kiosk continued its successful run at Rio Rancho's Loma Colorado Public Library. Community outreach continued with various events throughout the year. The team rewrote and produced new print materials on a variety of MS4-related topics, including proper hazardous waste disposal, proper pet waste disposal, stormwater pollution reduction and awareness of hazardous on-the-job chemicals. Updates and improvements to the team's website **keeptheriogrand.com** began.

Team partners and supporters disseminated information on stormwater quality and pollution prevention through municipal water quality reports to stakeholders. Specialty advertising giveaways relating to stormwater quality awareness were ordered/reordered for use at public events. MRGSQT's annual budget for all these activities, excluding Type 9 items, donated hours by team members, and funding for Arroyo Classroom, RiverXchange and B.E.M.P., is $50,000. The contractor, CWA Strategic Communications, donated $2,328.19 in services during the 12-month period. We have summarized the activities below and on the following pages:

WEBSITE (www.keeptheriogrand.org)

The Team contracted with CWA Strategic Communications to redesign the website and the new site is expected to roll out in October 2018. Content and links have been updated and new material added. The site will be more user-friendly and offer Team members an easy way to upload, store and share materials.

FACEBOOK PAGE

In conjunction with the SQT website, a Facebook page contains posts and updated information at: (https://www.facebook.com/Keeptheriogrand). The page has 141 "Likes" and the Team occasionally boosts posts during events to obtain more visibility.

Estimated number of individuals reached by this activity: 141
Permit Reference(s): General SWP, Construction, Pet Waste
Audience(s): Children, Adults

EVENTS

Between July 1, 2017 and June 30, 2018, MRGSQT members and their partner agencies reported participating in a total of 72 community outreach/educational events reaching 28,626 adults and children. ***Details can be found in Exhibit 1 at the end of this report.***

Estimated number of individuals reached by these community outreach/education events (with duplications): 28,626
Permit Reference(s): General SWP, Construction, Pet Waste, Construction, Household Hazardous Waste, Illicit Discharge and Animal Sources
Audience(s): Children, Adults

GENERAL MATERIALS DISTRIBUTION

As appropriate, team members distribute materials at events. Following are inventories of materials on hand from July 1, 2017 through June 30, 2018.

Total estimated number of people reached by these activities: 4,181
Cost per person reached (may be some duplication): $0.60
Permit Reference(s): General SWP, Pet Waste, Household Hazardous Waste
Audience(s): Children, Adults

STORMWATER QUALITY TEAM Inventory					
Item	**Starting Qty as of 7/1/2017**	**Quantity**	**Distributed**	**Ending Qty as of 6/30/2018**	**Cost of Materials Distributed**
"Keep the Rio Grand" Bumper Stickers	798		48	750	$48.00
"Reduce Stormwater Pollution at Home" brochure	170		70	100	$10.00
SQT Brochure - "New Dog or Cat"	2,620		510	2,110	$76.50
Dog-shaped Poop Bag Dispensers	426		340	2,586	$638.66
"Don't Contaminate the River" stickers	1,040		780	260	$148.20
Poo Emoji Squeezies	4,570		430	3,840	$656.61
Morphing Fish Bags (added 1500 more on 8/31/2017)	187	1,500	770	917	$2,816.12
Silicone Pet Food Can lids (added 8/31/2017)		2,500	733	1,767	$833.86
New Pet Rack Cards (added 6/1/18)		5,000	100	4,900	$8.45
FOG Rack Cards (added 6/1/18)		5,000	100	4,900	$8.45
No Poop Fairy Rack Cards (added 6/1/18)		5,000	100	4,900	$8.45
Professionals Harmful Chemicals Rack Card (added 6/1/18)		5,000	100	4,900	$8.45
Reduce Stormwater Pollution at Home Rack Card (added 6/1/18)		5,000	100	4,900	$8.45
Large Stormwater display - 8 ft (updated 6/1/18)	1				$1,155.00
Tabletop Stormwater display - 6 ft (added 6/1/18)	1				$480.00
			4,181		**$2,511.11**

The SQT invested in a smaller tabletop display to take to events with limited space. The larger 8 ft. standing display was also updated with new panels featuring updated information.

EDUCATIONAL ACTIVITIES

Educational Kiosk at Rio Rancho's Main Loma Colorado Library.

The kiosk remained at Rio Rancho's main library through April 2018 and continued to educate citizens (primarily children) about stormwater issues. The kiosk features:

- An interactive stormwater system map where children can press various points to learn the roles arroyos and channels play in the stormwater system and how to keep from polluting that system. The system stretches from Bernalillo on the north through Rio Rancho and into Albuquerque.
- A "Scoop the Poop" game that lets children choose one of three dogs and learn how to properly pick up after that dog. This is important because pet waste is a major source of *E coli* contamination in the Rio Grande.
- An educational panel on common types of trash, debris and chemicals that pollute the Rio Grande including appliances and electronics, automotive products such as oil, batteries and gasoline, glass and cement, household cleaners, yard waste, prescription and over-the-counter medicines.
- A touch screen that includes facts about each arroyo and the Rio Grande.

Stormwater Quality Team Creates Interactive Kiosk for Children

Maps, Games and Videos Highlight Stormwater Runoff System and Its Link to Rio Grande

The Mid Rio Grande Stormwater Quality Team has created a kiosk to teach children about our area's stormwater runoff system and what they can do to keep from polluting that system and the Rio Grande. The three-sided kiosk, which debuted at the Downtown Children's Library, uses touch and video screens to engage and teach children that everything entering the stormwater system can end up in the Rio Grande – and provides practical tips on what they can do to keep our river clean.

The three-sided kiosk uses interactive screens to engage and teach kids that "all roads lead to the Rio Grande" and offers information on how people can help keep the river clean.

INTERACTIVE STORMWATER SYSTEM MAP Children can press various points on a map to learn the role various arroyos and channels play in our stormwater system and how to keep from polluting that system.

"SCOOP THE POOP" GAME Children can select the dog they want and learn how to pick up after that dog. Information panels explain how to properly dispose of dog and cat waste and also explore common types of hazardous materials that pollute the Rio Grande, endangering the wildlife and people who rely on the river.

INTERACTIVE EDUCATIONAL SCREEN allows children to watch a variety of educational videos produced by the Stormwater Team and reminds them that everything they throw on the ground flows to the Rio Grande.

For more information visit **www.keeptheriogrand.org**

JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY/ JUNE	TOTAL
18,456	19,712	16,147	16,173	14,877	12,411	17,274	18,470	18,428	15,486	N/A	**167,434**

Total number of children and adults viewing the kiosk from July 1, 2017 through April 30, 2018. Numbers for May and June, 2018 were not available at the time this report was compiled.

Plans are in the works to upgrade the kiosk, change the software platform of the games for easier access and analytic tracking and conduct some repairs on existing hardware.

STUDENTS AND TEACHERS REACHED THROUGH PARTNER EDUCATIONAL PROGRAMS – ARROYO CLASSROOM, RIVERXCHANGE AND BOSQUE ECOSYSTEM MONITORING PROGRAM (B.E.M.P.)

Arroyo Classroom

The Arroyo Classroom program utilizes natural arroyos as outdoor classrooms and brings local animals into the classroom to motivate third graders to respect the arroyos as important wildlife habitat. In the 2017-2018 school year, the program served 33 classes within the Rio Rancho Public School System, reaching approximately 33 teachers and 770 students.

For more information, see Exhibit 2, Arroyo Classroom's 2017-2018 report to the Mid Rio Grande Stormwater Quality Team.

RiverXchange

RiverXchange is an innovative, long-term outreach program that integrates water resource topics with computer technology, student writing, and a hands-on curriculum to meet specific, measurable outcomes.

Since 2007, the program has enabled upper elementary classes from New Mexico to become “high tech pen pals” with classes outside the state to share what they learn about the geography, culture, and ecology of their local river and watershed. Including these partner classes, the program has served over 14,000 students. Each student spends about 25 hours engaged with the program over the course of the school year. The curriculum incorporates hands-on activities, and multiple classroom presentations by local water resources experts. During the 2017-2018 season, 39 fifth-grade classes, most of which were Title I schools (1,188 students and 42 teachers) participated in New Mexico. RiverXchange conducted 20 classes (612 students) in Bernalillo County and 19 classes (576 students) in Sandoval County

For more information, see Exhibit 3, RiverXchange’s 2017-2018 report to the Mid Rio Grande Stormwater Quality Team.

B.E.M.P.

The main objective of the *Stormwater Science* outreach education program of the Bosque Ecosystem Monitoring Program (B.E.M.P.) is to teach students that the health of the Rio Grande is directly related to the health of the surrounding watershed. The *Stormwater Science* program includes a one and one-half hour classroom activity, and a 4-5 hour study trip to the Rio Grande. During the 2017-2018 school-year 2,247 students participated in *Stormwater Science* activities in their classrooms, in the field or both. The classroom program was delivered to 1,517 students in 30 classrooms at 19 different schools in Rio Rancho, Albuquerque, and Belen. See ***Exhibit 5*** for the BEMP Report on the 2017-2018 school year and its *Stormwater Science* report.

For more information, see Exhibit 4, B.E.M.P.’s 2017-2018 report to the Mid Rio Grande Stormwater Quality Team.

Total estimated number of people reached by these educational activities: 173,231
Permit Reference(s): General SWP, Pet Waste, Animal Sources, Household Hazardous Waste, Illicit Discharges
Audience(s): Children, Adults

PUBLIC EDUCATION CAMPAIGNS ON PROPER DISPOSAL OF FATS, OILS & GREASE

In November and December 2016, the City of Rio Rancho and the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) planned and implemented public education campaigns on how to dispose of cooking grease properly. The campaigns were timed to coincide with the holiday cooking season (Thanksgiving through Christmas). The City of Rio Rancho campaign included:

Print Ads – Two (red, green) small ads ran twice in one issue of the *Observer* the Sunday before Thanksgiving (11/19) reaching approximately 60,000 readers (with duplication).

Digital Outdoor Boards – 5 digital outdoor boards ran one week in November (11/20-11/26), alternating the red and green boards. Two of those boards ran an additional week (11/27-12/3). 7 boards ran in December the week before Christmas (12/18-12/24). A total estimated audience of 181,648 adults (18 years of age and older) with duplication was reached.

Movie Theaters – One 30-second spot played 750 times in Rio Rancho's 14-plex Premiere Theater for one week in November (12/15-12/21) and two weeks in December (12/15-12/28) reaching approximately 30,000 people with duplication.

In addition, the City of Rio Rancho published an article in its Fall 2017 newsletter. "Beware the Holiday FOG!" offered information about the damage fats, oils and grease can do to sewer mains to the newsletter's 37,000 mail recipients.

Total estimated audience reached (with duplication): 308,648

Beware the Holiday FOG!

FATS, OILS, AND GREASE (FOG) are a costly sewer problem for municipalities and the FOG problem is much worse during the holiday season. Grease and fats that are put down drains or in the toilet solidify and can create "fatbergs." They can clog customer sewer lines causing raw sewage to back up into the homes and these fatbergs can also clog the large sewer mains causing overflows of raw sewage.

A recent article in the New York Times tells about a fatberg in London. The London fatberg is 1/6 of a mile long and weighs more than 140 tons. To see a photo and read the article about the fatberger visit **https://nyti.ms/2eVZyk6**

Disposable wipes, baby diapers and feminine hygiene products make the fatbergs more solid, like a rock in some cases. ***All of these products, including flushable wipes, should be put in the trash, not down the toilet.***

Keep your holidays clean from backups: dispose of FOG in the trash. ***Cool It. Can It. Trash It.***

Get Your **FREE**
"Cease the Grease"
Spatula*

Stop by the Utilities Department Environmental Programs
(City Hall Room 250)

**While supplies last*

Rio Rancho Utilities :: Fall 2017 :: 3

The Albuquerque Bernalillo Water Utility Authority (a Stormwater Team supporter) expanded its annual holiday campaign on Fats, Oils & Grease in the fall of 2017 to include messages about what not to flush down the toilet (trash and flushable wipes) as well as what not to place down the sink (grease). New outdoor boards, a new television spot and a new radio spot were created, along with a bill insert stuffer mailed to the Water Authority's customers. The campaign, which ran in November, December, January and February, reached the following audiences:

Bill Insert – ran in December, January and February – estimated reach 210,000 bill inserts per month = 630,000 adults with duplication.

Radio spot – 600 30-second radio spots reaching a targeted audience of women 25-64, with a total reach of 180,200 with duplication.

Television spot – 1,418 spots reaching an estimated audience of 1,098,510 with duplication.

Outdoor – Digital messages ran on 4 outdoor boards for 2 weeks in November (around Thanksgiving) and in December (around Christmas). Total estimated reach was 1,013,420 with duplication.

Total audience reached (with duplication): 2,922,130

PRINT MATERIALS

The Stormwater Quality Team created a series of rack cards addressing specific MS4 Permit issues:

- ***Reducing Stormwater Pollution at Home –*** for residential use
- ***Keep Harmful Chemicals from Entering Storm Drains –*** for professionals dealing with hazardous chemicals
- ***Dispose of Fats, Oils & Grease (FOG) Properly –*** for residential and professional use
- ***Don't Poo-Poo the Rio! –*** a handout for new pet owners, to be distributed at animal control and animal rescue organizations
- ***There IS NO Poop Fairy! –*** a general handout about proper pet waste disposal

These materials are distributed at public events and also at appropriate venues such as animal rescue organizations, libraries, city halls, etc.

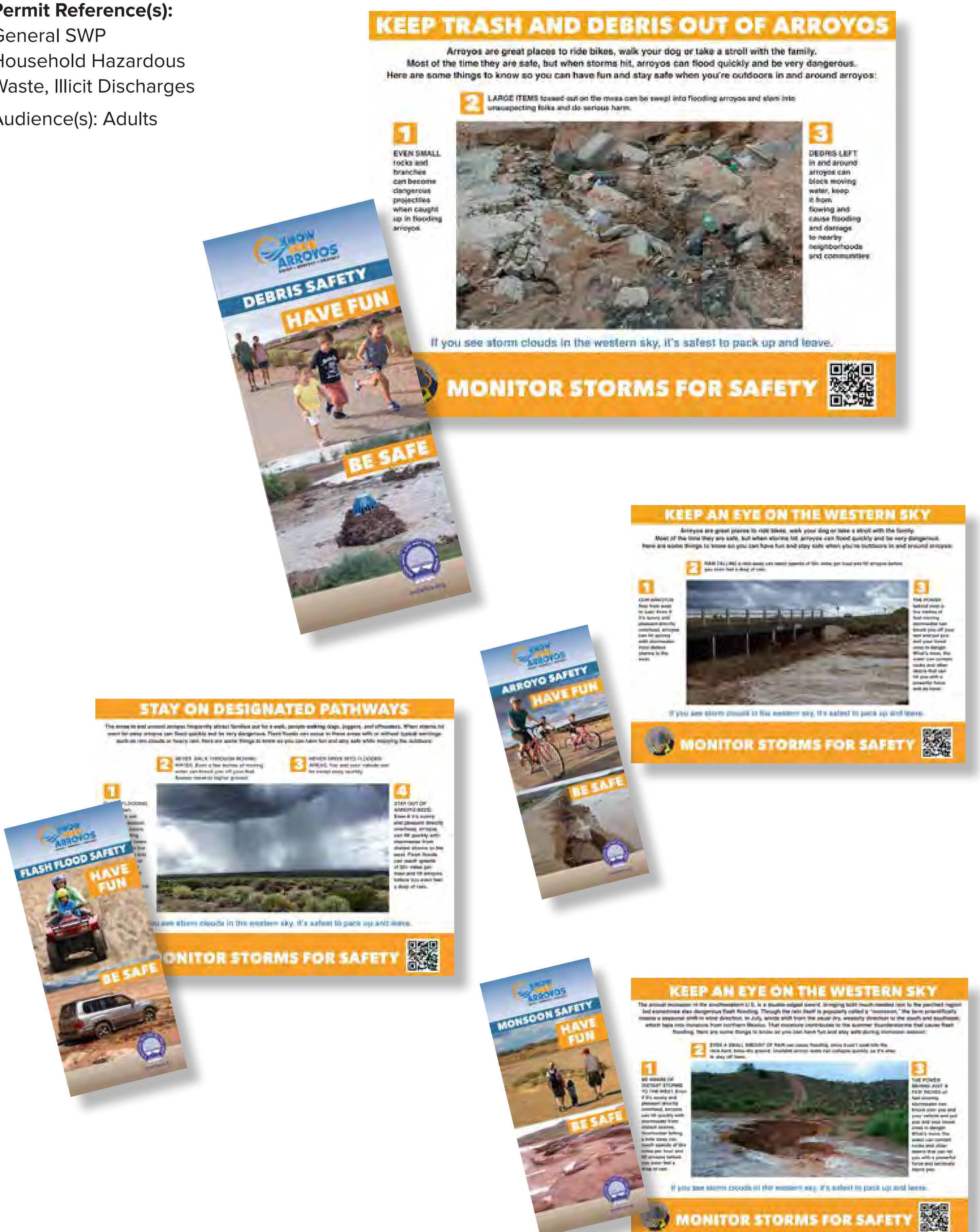
Permit Reference(s):
General SWP, Pet Waste, Animal Sources, Household Hazardous Waste, Illicit Discharges

Audience(s):
Children, Adults

SSCAFCA, a MRSQT member, produced several brochures as part of its Arroyo Safety campaign.

Permit Reference(s):
General SWP
Household Hazardous
Waste, Illicit Discharges

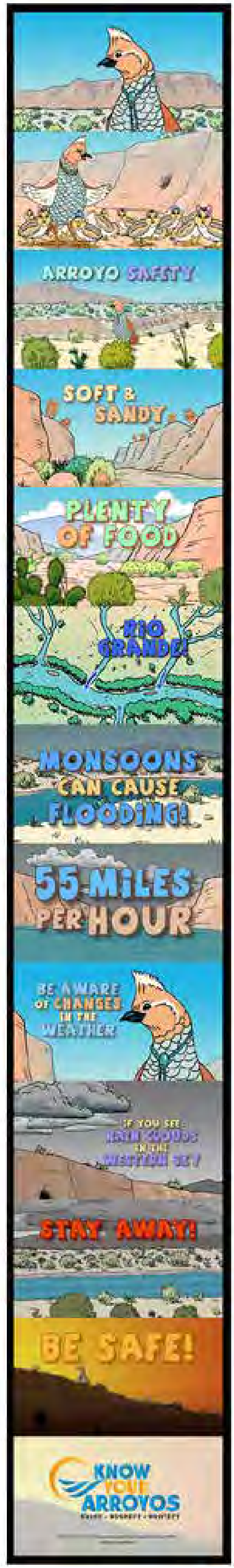
Audience(s): Adults



SSCAFCA also produced two animations for children. One is entitled Arroyo Safety and the other is called "Respect Your Arroyos." The videos are shown in elementary school classes and are accompanied by an activity workbook that reinforces the information addressed in the animations with coloring pages and word games.

Permit Reference(s):
General SWP, Pet Waste, Household Hazardous Waste

Audience(s):
Children



HOUSEHOLD HAZARDOUS WASTE COLLECTION

Household Hazardous Waste Diverted from Landfill

MONTH	MEMBER	POUNDS COLLECTED	POUNDS RECYCLED
2017			
July	City of Albuquerque	52,381	50,506
August	“	39,319	36,897
September	“	29,165	27,875
October	“	44,614	42,504
November	“	35,360	33,106
December	“	26,745	24,647
2018			
January	“	27,592	24,527
February	“	22,297	20,314
March	“	32,635	31,366
April	“	49,004	43,673
May	“	37,907	36,152
June	“	28,498	25,876
TOTAL	“	**425,517**	**350,136**

DONATIONS

The City Of Albuquerque donated $65,000 to organizations for additional educational and training programs:

MEMBER	AMOUNT DONATED	RECIPIENT	PURPOSE
City of Albuquerque	$45,000	The Nature Conservancy	For Education and Outreach
“	$20,000	Earth Force	For Education and Outreach

ESTIMATED TOTAL NUMBER OF PEOPLE REACHED THROUGH ALL ADVERTISING, EDUCATIONAL AND PUBLIC OUTREACH ACTIVITIES DURING 2016-2017:

Obviously, some people were reached by more than one activity, but in gross numbers an estimated **3,434,957** people were reached with a stormwater quality/stormwater pollution prevention message during the 2017-2018 fiscal year.

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
2017					
Earth Day Puesta Del Sol Elementary-Enviroscape Demo	4/20/17	Elementary School students	SWP	600	
MS4 permit presentation-Rotary Club in Albuquerque	4/20/17	Adults	SWP	40	
Enviroscape Presentation-Mom's Group at Tijeras Creek Restoration Project	7/11/17	Adults	SWP	20	
Rolling River Presentation-Isleta Pueblo Environmental Fair	7/15/17	All Ages	SWP	50	
Rolling River Presentation-Water Day at Railyards Market	7/16/17	All Ages	SWP	100	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 500 Balloon Fiesta Pkwy NE area	8/19/17	Adults	HHW	401	Collected, segregated, packaged, labeled, transported and disposed of 26,218 pounds of Household Hazardous Waste, and 3,600 pounds of Non-Regulated Solid Waste (an average of 74.35 pounds of waste per customer).
Enviroscape Presentation-East Mountain Celebration (with TCRP tours)	9/24/17	All Ages	SWP	50	
Rolling River Presentation-Valle de Oro 5th Birthday	9/30/17	All Ages	SWP	125	
Corrales Harvest Fest	9/30/17	All Ages	SWP	8,000	
Rolling River Presentation-RMYC at TCRP	10/2/17	All Ages	SWP	125	
Rolling River Presentation-RMYC at TCRP	10/3/17	All Ages	SWP		
Rolling River Presentation-John Adams and Jimmy Carter MS at Valle de Oro	10/6/17	Middle School students	SWP	33	
Rolling River Presentation-Atrisco Academy HS, Ernie Pyle MS at Valle de Oro	10/9/17	Middle School students	SWP	50	
Rolling River Presentation-Van Buren HS at Valle de Oro	10/11/17	High School students	SWP	39	
Rolling River Presentation-TCRP field trip tour - Carlito Springs	10/19/17	All Ages	SWP		
Rolling River Presentation-Rio Rancho Children's Water Festival	10/23/17	Fourth grade students	SWP	75	
Rio Rancho Children's Water Festival	10/23-24/2017	Elementary Students and Teachers	SWP	1,672	
Enviroscape Presentation-TCRP field trip tour - Carlito Springs	10/25/17	All Ages	SWP		
Animal Humane's Doggie Dash and Dawdle	10/31/17	All Ages	AS, PW, SWP	4,000	Animal Humane's signature event and largest fundraiser
Rolling River Presentation-RMYC at TCRP	11/13/17	All Ages	SWP		
UNM Water Student Group	11/30/17	College Students	SWP	35	

AS: Animal Sources
CON: Construction
HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RiverXChange, Georgia O'Keefe	12/14/17	Students, Adults	SWP	52	75 Shrubs Planted
2018					
RiverXChange, Vista Elem.	1/11/18	Students, Adults	SWP	66	78 Shrubs Planted
Holy Ghost	1/18/18	Students, Adults	SWP	47	42 Shrubs, 10 Cottonwoods Planted
RiverXChange, Monte Vista	1/25/18	Students, Adults	SWP	31	14 Cottonwoods Planted
RiverXChange, Bern Co/ O'Keefe	1/26/18	Students, Adults	SWP	59	29 Cottonwoods Planted
Assisted MRGCD with planting	1/27/18	Youth, Adults	SWP	184	Cottonwoods, Coyote Willows and Goodings Willows Planted
MRGCD/Fish & Wildlife at Glass Gardens	1/27/18	All Ages	SWP	184	110 Plants and caging
KOB Health and Wellness Fair at EXPO NM	1/27/18-1/28/2018	All Ages	HHW, PW, SWP	8,000	Annual event focusing on wellness; handed out giveaways,surveys
Nahalat Jewish Congregation	1/28/18	Adult		1	8 Cottonwoods Planted
Rolling River Presentation-Jefferson Middle School - Science Night	1/29/18	Middle School students	SWP		
GIOS Hubert Humphrey Elem. 4th grade	2/2/18	Students, Adults	SWP	26	20 Cottonwoods Planted
Former Peace Corps	2/3/18	Youth, Adults	SWP	83	100 Cottonwoods, 30 Shrubs Planted
RiverXChange, Colinas del Norte	2/6/18	Students, Adults	SWP	57	23 Cottonwoods Planted
RiverXChange, Martin Luther King	2/8/18	Students, Adults	SWP	56	40 Cottonwoods Planted
RiverXChange, John Baker	2/9/18	Students, Adults	SWP	53	48 Cottonwoods Planted
Roots and Shoots	2/10/18	Youth, Adults	SWP	15	25 Cottonwoods/9 Shrubs Planted
GIOS Helen Cordero School	2/16/18	Children, Adults	SWP	27	45 Twigs Planted
GIOS Explore Academy	2/19/18	Students, Adults	SWP	10	37 Cottonwoods Planted
RiverXChange, Sandia Vista	2/20/18	Students, Adults	SWP	32	30 Cottonwoods Planted
RiverXChange, NM Connections	2/21/18	Students, Adults	SWP	24	25 Cottonwoods Planted
Holy Ghost	2/22/18	Students, Adults	SWP	31	100 Cottonwoods Planted
RiverXChange, John Baker	2/23/18	Students, Adults	SWP	63	50 Cottonwoods Planted
UNM Pathways	2/24/18	Youth, Adults	SWP	69	105 Cottonwoods/30 shrubs Planted
GIOS Inez Elem. 5th grade	2/26/18	65 students/9 adults	SWP	74	45 Cottonwoods Planted
RiverXChange, Osuna	2/28/18	54 students/8 adults	SWP	62	40 Cottonwoods Planted
RiverXChange, Rio Rancho Elem	3/1/18	54 students/7 Adults	SWP	61	40 Cottonwoods Planted
Family and Friends	3/1/18	Children, Adults	SWP	10	30 Cottonwoods & Black Willows Planted
RiverXChange, Rio Rancho Elem	3/2/18	57 students/9 Adults	SWP	56	33 Cottonwoods Planted
RiverXChange, MLK	3/6/18	54 students/9 Adults	SWP	63	39 Cottonwoods & Black Willows Planted
Bosque School	3/8/18	17 Students/3 Adults	SWP	20	12 Cottonwoods & Black Willows Planted
Bosque School	3/8/18	18 Students/4 Adults	SWP	22	12 Cottonwoods & Black Willows Planted
Bosque School	3/9/18	18 Students/4 Adults	SWP	22	13 Cottonwoods & Black Willows Planted
Bosque School	3/9/18	18 Students/3 Adults	SWP	21	20 Cottonwoods & Black Willows Planted
Sandia Civitans	3/10/18	1 Youth/ 11 Adults	SWP	12	36 Cottonwoods & Black Willows Planted

AS: Animal Sources
CON: Construction
HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RR Schools	3/10/18	46 Students/6 Adults	SWP	52	22 Cottonwoods & Black Willows Planted
RiverXChange, Rio Rancho Elem	3/13/18	Students, Adults	SWP	31	50 Cottonwoods Planted
RiverXChange, MLK	3/20/18	Students, Adults	SWP	58	24 Cottonwoods Planted
RiverXChange, Osuna/ Bandelier	3/21/18	Students, Adults	SWP	45	35 Cottonwoods Planted
RiverXChange, Colinas del Norte	3/22/18	Students, Adults	SWP	59	26 Cottonwoods Planted
RiverXChange, Colinas del Norte	3/23/18	Students, Adults	SWP	31	20 Cottonwoods Planted
Rolling River Presentation-Taft and Taylor MS at Valle de Oro	4/6/18	Middle School students	SWP	46	
Rolling River Presentation-UNM Sustainability Expo	4/19/18	College students	SWP	250	
Rolling River Presentation-Earth Day at Annunciation Catholic School	4/20/18	Elementary and Middle School students	SWP		
Rolling River Presentation-Cancer Services of NM Spring Retreat	4/21/18	All Ages	SWP	30	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 6137 Edith Blvd. NE area at	4/21/18	Adults	HHW	415	Collected, segregated, packaged, labeled, transported and disposed of 27,017 pounds of Household Hazardous Waste, and 3,200 pounds of Non-Regulated Solid Waste (an average of 72.81 pounds of waste per customer).
Rolling River Presentation-BEMP Student Congress	4/27/18	High School students	SWP		
Rolling River Presentation-Native Fish in the Classroom Field Trip (Santa Ana Pueblo)	5/8/18	Middle School students	SWP	48	
Rolling River Presentation-Amy Biehl HS, Garfield MS at Valle de Oro	5/10/18	Middle School students	SWP	32	
Rolling River Presentation-Cielo Azul Elementary - Arroyo Clean Up Field Day	5/18/18	Elementary School students	SWP	87	
Rolling River Presentation-Explora Science Fiesta	5/19/18	Elementary and Middle School students	SWP	400	
Rolling River Presentation-Ace Leadership HS at Valle de Oro	5/22/18	High School students	SWP	34	
TOTAL PEOPLE INVOLVED IN EVENT ACTIVITIES				**26,626**	

AS: Animal Sources
CON: Construction
HHW: Household Hazardous Waste
ID: Illicit Discharges
PW: Pet Waste
SSS: Septic & Sanitary Sewer Systems
SWP: General Stormwater Pollution Prevention

Exhibit 1
Event Participation 2017-2018

NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
2017					
Earth Day Puesta Del Sol Elementary-Enviroscape Demo	4/20/17	Elementary School students	SWP	600	
MS4 permit presentation-Rotary Club in Albuquerque	4/20/17	Adults	SWP	40	
Enviroscape Presentation-Mom's Group at Tijeras Creek Restoration Project	7/11/17	Adults	SWP	20	
Rolling River Presentation-Isleta Pueblo Environmental Fair	7/15/17	All Ages	SWP	50	
Rolling River Presentation-Water Day at Railyards Market	7/16/17	All Ages	SWP	100	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 500 Balloon Fiesta Pkwy NE area	8/19/17	Adults	HHW	401	Collected, segregated, packaged, labeled, transported and disposed of 26,218 pounds of Household Hazardous Waste, and 3,600 pounds of Non-Regulated Solid Waste (an average of 74.35 pounds of waste per customer).
Enviroscape Presentation-East Mountain Celebration (with TCRP tours)	9/24/17	All Ages	SWP	50	
Rolling River Presentation-Valle de Oro 5th Birthday	9/30/17	All Ages	SWP	125	
Corrales Harvest Fest	9/30/17	All Ages	SWP,	10,000	
Rolling River Presentation-RMYC at TCRP	10/2/17	All Ages	SWP	125	
Rolling River Presentation-RMYC at TCRP	10/3/17	All Ages	SWP		
Rolling River Presentation-John Adams and Jimmy Carter MS at Valle de Oro	10/6/17	Middle School students	SWP	33	
Rolling River Presentation-Atrisco Academy HS, Ernie Pyle MS at Valle de Oro	10/9/17	Middle School students	SWP	50	
Rolling River Presentation-Van Buren HS at Valle de Oro	10/11/17	High School students	SWP	39	
Rolling River Presentation-TCRP field trip tour - Carlito Springs	10/19/17	All Ages	SWP		
Rolling River Presentation-Rio Rancho Children's Water Festival	10/23/17	Fourth grade students	SWP	75	
Rio Rancho Children's Water Festival	10/23-24/2017	Elementary Students and Teachers	SWP	1,672	
Enviroscape Presentation-TCRP field trip tour - Carlito Springs	10/25/17	All Ages	SWP		
Animal Humane's Doggie Dash and Dawdle	10/31/17	All Ages	AS, PW, SWP	4,000	Animal Humane's signature event and largest fundraiser
Rolling River Presentation-RMYC at TCRP	11/13/17	All Ages	SWP		
UNM Water Student Group	11/30/17	College Students	SWP	35	

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NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RiverXChange, Georgia O'Keefe	12/14/17	Students, Adults	SWP	52	75 Shrubs Planted
2018					
RiverXChange, Vista Elem.	1/11/18	Students, Adults	SWP	66	78 Shrubs Planted
Holy Ghost	1/18/18	Students, Adults	SWP	47	42 Shrubs, 10 cottonwood Planted
RiverXChange, Monte Vista	1/25/18	Students, Adults	SWP	31	14 Cottonwood Planted
RiverXChange, Bern Co/ O'Keefe	1/26/18	Students, Adults	SWP	59	29 Cottonwood Planted
Assisted MRGCD with planting	1/27/18	Youth, Adults	SWP	184	Cottonwood, Coyote Willow and Goodings Willow Planted
MRGCD/Fish & Wildlife at Glass Gardens	1/27/18	All Ages	SWP	184	110 Plants and caging
KOB Health and Wellness Fair at EXPO NM	1/27/18-1/28/2018	All Ages	HHW, PW, SWP	8,000	Annual event focusing on wellness; handed out giveaways,surveys
Nahalat Jewish Congregation	1/28/18	Adult		1	8 Cottonwood Planted
Rolling River Presentation-Jefferson Middle School - Science Night	1/29/18	Middle School students	SWP		
GIOS Hubert Humphrey Elem. 4th grade	2/2/18	Students, Adults	SWP	26	20 Cotton Planted
Former Peace Corps	2/3/18	Youth, Adults	SWP	83	100 Cottonwood, 30 Shrubs Planted
RiverXChange, Colinas del Norte	2/6/18	Students, Adults	SWP	57	23 Cottonwood Planted
RiverXChange, Martin Luther King	2/8/18	Students, Adults	SWP	56	40 Cottonwood Planted
RiverXChange, John Baker	2/9/18	Students, Adults	SWP	53	48 Cottonwood Planted
Roots and Shoots	2/10/18	Youth, Adults	SWP	15	25 Cottonwood/9 Shrubs Planted
GIOS Helen Cordero School	2/16/18	Children, Adults	SWP	27	45 Twigs Planted
GIOS Explore Academy	2/19/18	Students, Adults	SWP	10	37 Cottonwood Planted
RiverXChange, Sandia Vista	2/20/18	Students, Adults	SWP	32	30 Cottonwood Planted
RiverXChange, NM Connections	2/21/18	Students, Adults	SWP	24	25 Cottonwood Planted
Holy Ghost	2/22/18	Students, Adults	SWP	31	100 Cottonwood Planted
RiverXChange, John Baker	2/23/18	Students, Adults	SWP	63	50 Cottonwood Planted
UNM Pathways	2/24/18	Youth, Adults	SWP	69	105 Cottonwood/30 shrubs Planted
GIOS Inez Elem. 5th grade	2/26/18	65 students/9 adults	SWP	74	45 cottonwood Planted
RiverXChange, Osuna	2/28/18	54 students/8 adults	SWP	62	40 Cottonwood Planted
RiverXChange, Rio Rancho Elem	3/1/18	54 students/7 Adults	SWP	61	40 Cottonwood Planted
Family and Friends	3/1/18	Children, Adults	SWP	10	30 Cottonwood & Black Willow Planted
RiverXChange, Rio Rancho Elem	3/2/18	57 students/9 Adults	SWP	56	33 Cottonwood Planted
RiverXChange, MLK	3/6/18	54 students/9 Adults	SWP	63	39 Cottonwood & Black Willow Planted
Bosque School	3/8/18	17 Students/3 Adults	SWP	20	12 Cottonwood & Black Willow Planted
Bosque School	3/8/18	18 Students/4 Adults	SWP	22	12 Cottonwood & Black Willow Planted
Bosque School	3/9/18	18 Students/4 Adults	SWP	22	13 Cottonwood & Black Willow Planted
Bosque School	3/9/18	18 Students/3 Adults	SWP	21	20 Cottonwood & Black Willow Planted
Sandia Civitans	3/10/18	1 Youth/ 11 Adults	SWP	12	36 Cottonwood & Black Willow Planted
RR Schools	3/10/18	46 Students/6 Adults	SWP	52	22 Cottonwood & Black Willow Planted

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NAME OF PROGRAM/EVENT	EVENT DATE	TYPE OF AUDIENCE	MS4 CATEGORY	TOTAL REACHED	NOTES
RiverXChange, Rio Rancho Elem	3/13/18	Students, Adults	SWP	31	50 Cottonwood Planted
RiverXChange, MLK	3/20/18	Students, Adults	SWP	58	24 Cottonwood Planted
RiverXChange, Osuna/ Bandelier	3/21/18	Students, Adults	SWP	45	35 Cottonwood Planted
RiverXChange, Colinas del Norte	3/22/18	Students, Adults	SWP	59	26 Cottonwood Planted
RiverXChange, Colinas del Norte	3/23/18	Students, Adults	SWP	31	20 Cottonwood Planted
Rolling River Presentation-Taft and Taylor MS at Valle de Oro	4/6/18	Middle School students	SWP	46	
Rolling River Presentation-UNM Sustainability Expo	4/19/18	College students	SWP	250	
Rolling River Presentation-Earth Day at Annunciation Catholic School	4/20/18	Elementary and Middle School students	SWP		
Rolling River Presentation-Cancer Services of NM Spring Retreat	4/21/18	All Ages	SWP	30	
Household Hazardous Waste Collection, joint effort with ACT Environmental Svcs, COA and Bernalillo County from the 6137 Edith Blvd. NE area at	4/21/18	Adults	HHW	415	Collected, segregated, packaged, labeled, transported and disposed of 27,017 pounds of Household Hazardous Waste, and 3,200 pounds of Non-Regulated Solid Waste (an average of 72.81 pounds of waste per customer).
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Rolling River Presentation-Native Fish in the Classroom Field Trip (Santa Ana Pueblo)	5/8/18	Middle School students	SWP	48	
Rolling River Presentation-Amy Biehl HS, Garfield MS at Valle de Oro	5/10/18	Middle School students	SWP	32	
Rolling River Presentation-Cielo Azul Elementary - Arroyo Clean Up Field Day	5/18/18	Elementary School students	SWP	87	
Rolling River Presentation-Explora Science Fiesta	5/19/18	Elementary and Middle School students	SWP	400	
Rolling River Presentation-Ace Leadership HS at Valle de Oro	5/22/18	High School students	SWP	34	

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Exhibit 2
ARROYO CLASSROOM 2017-2018

Arroyo Classroom Program

The Arroyo Classroom program utilizes our natural arroyos as outdoor classrooms and brings local animals into the classroom to motivate 3rd graders to respect the arroyos as important wildlife habitat. Orilla Consulting, LLC developed the program in 2012 and initially implemented the program for 7 classes at Maggie Cordova Elementary in Rio Rancho. In 2013, the program grew to serve 20 classes. On July 1st, 2015, Orilla Consulting, LLC transferred the program to Ciudad Soil and Water Conservation District as part of the larger education and outreach efforts we are involved in throughout Bernalillo and Sandoval Counties. In the 2017-2018 school year, we served 33 classes within Rio Rancho Public Schools, reaching approximately 33 teachers and 770 students.

Participating Schools:

- Cielo Azul Elementary (6 classes) *
- Enchanted Hills Elementary (7)
- Maggie Cordova Elementary (6) *
- Martin Luther King, Jr. Elementary (4) *
- Puesta del Sol (6) *
- Sandia Vista Elementary (4)

* Title 1 school

Deliverables to date:
All complete

- Stormwater Presentations: 33:33
- Arroyo Walk: 33:33
- Bat Presentations: 33:33
- Owl Presentations: 33:33

The program consists of a four-part series of lessons, based on grade-level science standards and addressing areas of interest to SSCAFCA, such as bats, burrowing owls, ATV use, pet waste, and arroyo safety. Educator Melissa McLamb delivered two of the lessons – an introductory lesson about watersheds, and a walking field trip to nearby arroyo habitat. Justin Stevenson of RD Wildlife Management, LLC delivered a lesson using live bats. Tavo Cruz of Envirological Services, Inc. delivered presentations with a live Burrowing Owl.

The watershed lesson expounds on the water cycle, already integral in 3rd grade curriculum. This year, we utilized the Enviroscape model to: introduce the concept of a watershed to students, demonstrate stormwater, emphasize arroyo safety and the importance of keeping our arroyos clean.

The arroyo walk is a highlight for students and teachers, as the majority of participating classes only receive one other field trip during the school year, and students always come away learning something new and interesting about the uniqueness of arroyo habitat. This lesson is about the unique adaptations of arroyo animals and plants, incorporates a walk out to a nearby arroyo (when available) and extensive discussion about arroyo safety *(see lesson plan in Appendix A.)* Melissa first talked to students about the difference between concrete-lined channels and sandy-bottomed arroyos, and emphasized that it is never safe to go into concrete-lined channels, while sandy-bottomed arroyos can be visited when there are no clouds in the sky. Students searched for evidence of animals living in the arroyo banks, learned about how lizards, and other cold-blooded animals, are adapted to the desert environment by moving about to regulate their temperature, and looked for certain adaptations of desert plants to minimize water loss in the desert.

In the lesson about bats, Justin discussed common myths about bats while pointing out how these myths can pose issues for bat populations as he addressed each one. He taught students about species common in their area, including what habitat they prefer, what they eat, the challenges they face, and what to do if one sees an injured bat. He talked about how important bats are in keeping insect populations under control, shared ways to encourage and protect bats and emphasized that kids should not be frightened of them, but also should never touch a bat if they find one. Students were able to view two different species of live microbats.

In the owl presentation, Octavio talked with students about what time of year burrowing owls are in our arroyos, what habitat they need, and what we can do to support and protect them. Tavo emphasized the impact of riding ATVs up the sides of arroyos and encouraged ways to care for burrowing owl habitat. He taught students that burrowing owls are protected by federal law, and that 3rd graders could be ambassadors and protectors for the owls. Each student was able to observe the burrowing owl up close, one at a time. We worked in coordination with Wildlife Rescue to bring in the live burrowing owl for each presentation.

Evaluation:

Teachers continue to thank us for offering this program and comment that it is helpful to them in terms of meeting science standards. They mention an increase in student engagement during all of the experiential lessons and find that students are curious and continue to discuss content post presentations. All 33 participating classes, participated in previous years and each school expressed interest in returning next year.

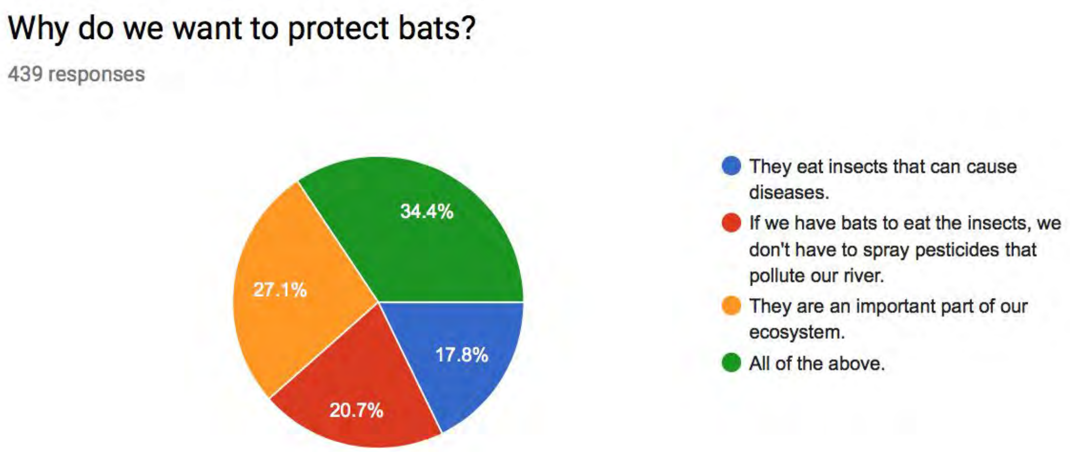
Our two main staff for the program, both resigned from the District in September. This abrupt change resulted in Education Coordinator, Melissa McLamb, taking the lead on the program and spread presentations throughout the entire school year, rather than in the 3-5 month time frame presentations have traditionally been scheduled within. Surveys which have been used in previous years were distributed to assess learning after the owl and bat presentations.

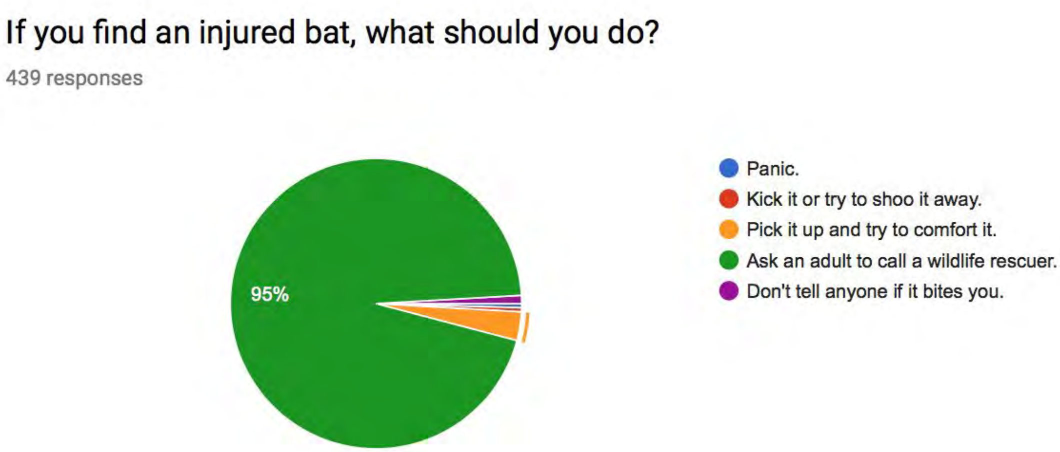
For our second year, we have collaborated with Cielo Azul Elementary for an arroyo clean up event with all of their 3rd grade classes. This year, City of Rio Rancho donated gloves and trash bags as well as provided a dumpster on site at Havasu Park, as part of the Great American CleanUp countrywide initiative. Collectively, students, teachers and other adults picked up 1180 pounds of trash at this event!

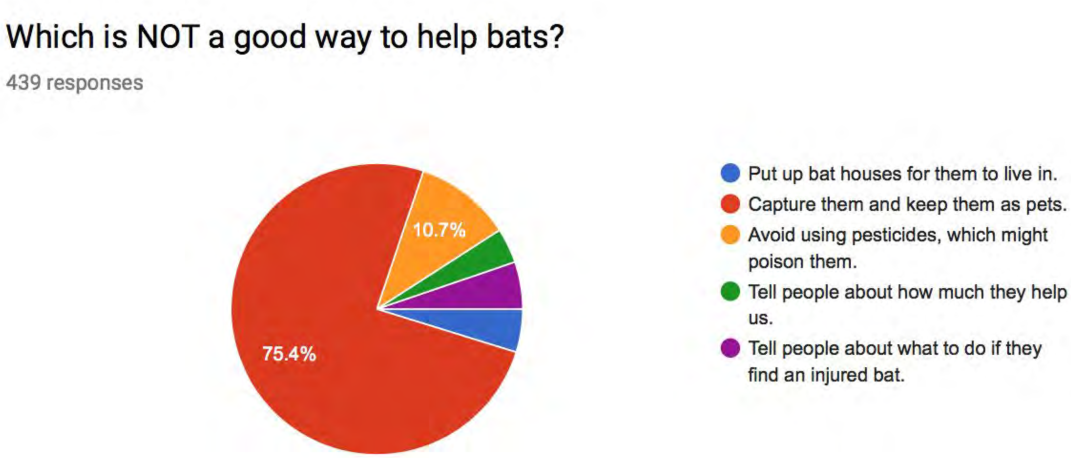
Post-Survey Metrics:

Bat survey

Total responses: 439

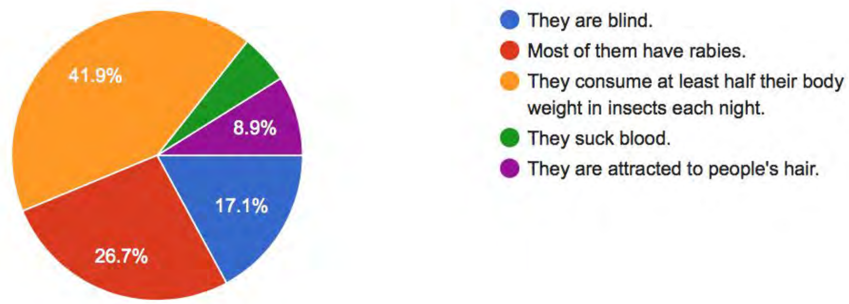






Which of the following is TRUE about the bats that live around Rio Rancho and Corrales?

439 responses

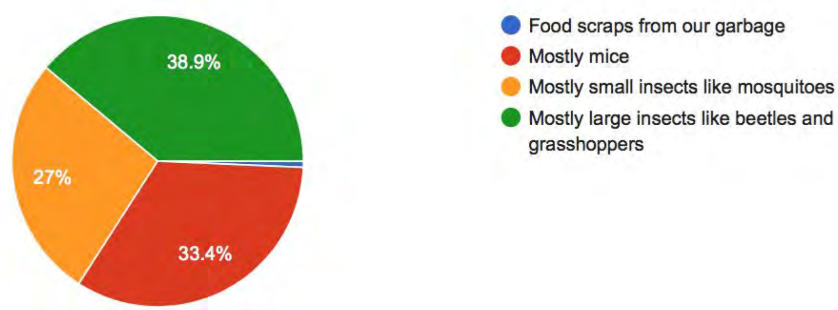


Owl survey

Total responses: 437

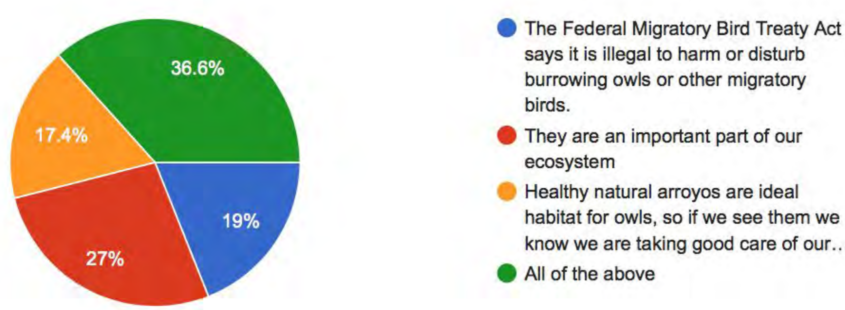
Burrowing owls eat

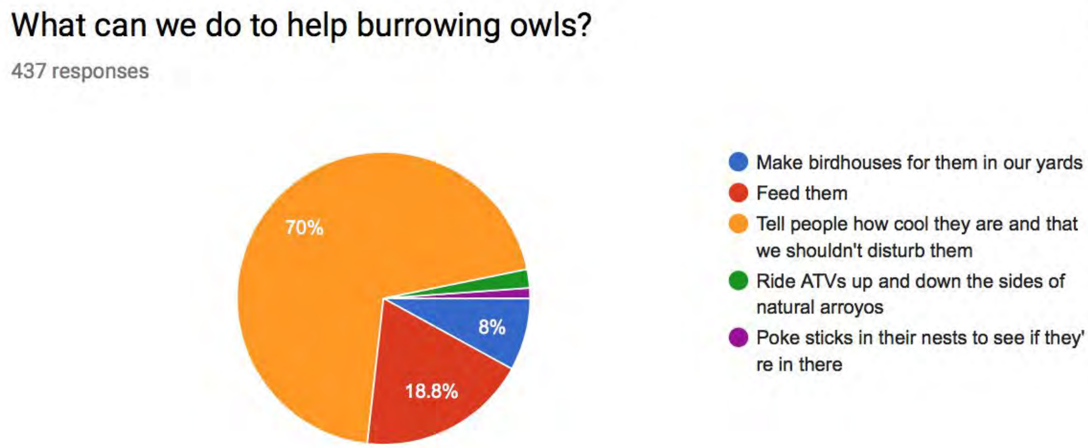
437 responses

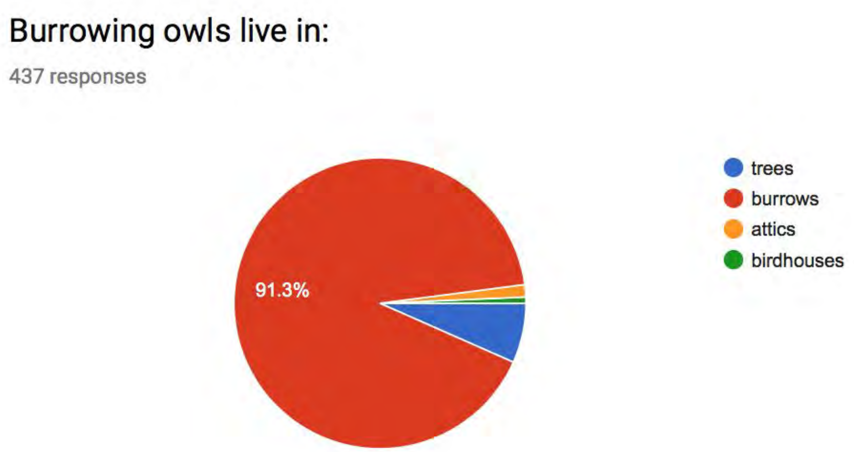


It's important to protect burrowing owls in our arroyos because:

437 responses







Survey Summary: Due to the time constraints and loss of programmatic knowledge created by the change in personnel and lack of training, many surveys were taken months after the bat and/or owl presentation. Surveys were shared with biologists for input. Our educators are noticing that questions with an "all of the above" answers seem difficult to determine for this age group. These surveys will be modified to become one survey in future years of programming, intended to assess comprehensive learning outcomes and distributed twice throughout the program -once before any presentations and once after all presentations are complete. Surveys will be revised to assess main conceptual objectives of each presentation. Surveys have been shared with collaborating biologists to improve questions and learning outcomes in the future.

Appendix A contains lesson plans; Appendix B contains supplemental materials; Appendix C contains photos and in-kind figures from the program.

Appendix A: Lesson Plans

Activity Guide for 3rd Grade – Animal and Plant Adaptations

1. What are we trying to teach the students in this activity?
Arroyos are cool places where animals live, animals and plants are adapted to live in the desert.

2. How can we tie this activity to our teaching goals:

Our Goals	**Where we can relate our goals to this activity**
Animals live in arroyos	Look for evidence of animals.
We should visit arroyos carefully	Talk about when it is safe.
Picking up dog poop keeps germs out of our river	We'll probably see poop, talk about how it can make animals sick.

Supplies:
- Thermometers
- Clipboards
- Poster of leaf adaptations
- Wax paper
- Paper towels
- Tape

3. How can we tie this activity to standards?
- Measure energy (temperature change)
- Posing a question, using numerical data, various methods to display results
- Animals and plants have adaptations that improve chances of survival
- Classifying animals and plants
- Living things cause changes to their environment, some detrimental, some beneficial

5. How should this activity be organized?

I. Pre-activity (10 minutes)
- Do you ever visit/play in arroyos? What do you do?
- What are arroyos for? Managing stormwater to keep our town from flooding when we get a heavy rain. **Show first flush video.**
- Talk about arroyo safety – don't go into arroyos when you see clouds in the sky.
- Because our arroyos are natural, with sandy sides and bottom, they are safer.
- In Albuquerque, the arroyos have concrete sides and water travels so fast, it is really dangerous to ever go in arroyos. Some arroyos come from the canyon where it might be raining but you can't see.
- Our arroyos are home to all kinds of animals and plants, so they are a wonderful place to enjoy nature. What kinds of animals do you think might live in the arroyo?
- Walk out to arroyo

II. Lizard activity (15 min)

- 5min Look for evidence of animals. What kind of evidence? Scat, tracks, holes.
- What kind of animals live in holes (besides snakes)?
- What do you think makes it difficult to live out here? Heat, sunburn, not much water, cold at night. Animals and plants have special **adaptations** (special things about their bodies) that make it easier for them to live in this habitat.
- How do they get water? From plants, from condensation under rocks.
- How could they avoid heat? Stay in burrows or shade during the day, active at night.
- Some animals love the heat, though! Lizards are cold-blooded, which doesn't mean they are actually cold. It means their body temperature is determined by the environment. They need to absorb heat from their surroundings to function.
- Each student take a thermometer. This is a lizard, and it needs to maintain its body temperature at a certain level: fence lizard 35C (95F), whiptail 38.6C (101F). How can it keep from getting too hot? How can it keep from getting too cold? Lizards regulate their body temperature through behavior.
- Plants do kind of the same thing – hold one palm out flat, one sideways. Which feels hotter? Prickly pear cactus pads grow sideways instead of flat to keep themselves cool!

IV. Plant activity (15 min)

- What do plants need in order to survive? Water, sunlight, air, soil
- What makes it difficult for plants in the desert? It's so hot and there's so little rain.
- How do plants get water? **Show evapotranspiration diagram.** It's kind of like when we're hot, we sweat. But if we lose too much water from sweating we get dehydrated.
- How do they keep cool? Remember prickly pear? **Show pictures of hedgehog and prickly pear cacti.** Desert plants can **s**hade themselves! Hedgehog cactus has lots of spines that shade the surface and also blocks the wind.
- The leaves of many desert plants are **adapted** so that they don't lose too much water.
- Show leaf adaptations poster (fuzzy, small, curled, waxy, green stems but no leaves)

If weather is ok:

- Out in arroyo, we'll do an investigation.
- How many of the plants we see will have these adaptations? Hypothesize.
- To be fair, we can't just pick the plants we like. Standing in one spot, collect the first 6 *different* leaves you see.
- Draw each one, and describe what adaptation it has.
- How many of your 6 leaves have one of the adaptations listed?
- Why don't all have it? Some plants avoid the heat by just growing and producing seed really fast before the weather gets hot, and then they just die off and leave their seeds to grow next year!
- Search for seeds.

If windy, inside activity:

- Let's investigate one way they keep water. **Dab water on board, cover one spot with paper towel, one spot with wax paper.** Which do you think will evaporate faster?
- **Show prickly pear picture.** Make model of prickly pear pad: paper towels with wax paper taped around the outside. **Show cut prickly pear pad.**
- Maybe do experiment: soak wax-covered and non wax-covered leaves in water and time how long they take to dry.

V. Conclusion (10 min)

- Arroyos are for flood control, and we shouldn't play in them when clouds are in the sky.
- But they are cool places where animals and plants live, and we can visit when it's clear weather.
- Animals and plants are adapted to live in the desert climate.
- What we do in arroyos affects the plants, and animals' habitats. Should we ride ATVs up the sides? That's something humans do to change our environment for the worse.
- Picking up dog poop is important because it can make animals sick. Where does the water go when it flows down the arroyo? The Rio Grande! Keeping dog poop out of the river is one way humans can change our environment for the better.
- Walk back to classroom

Leaf Adaptations

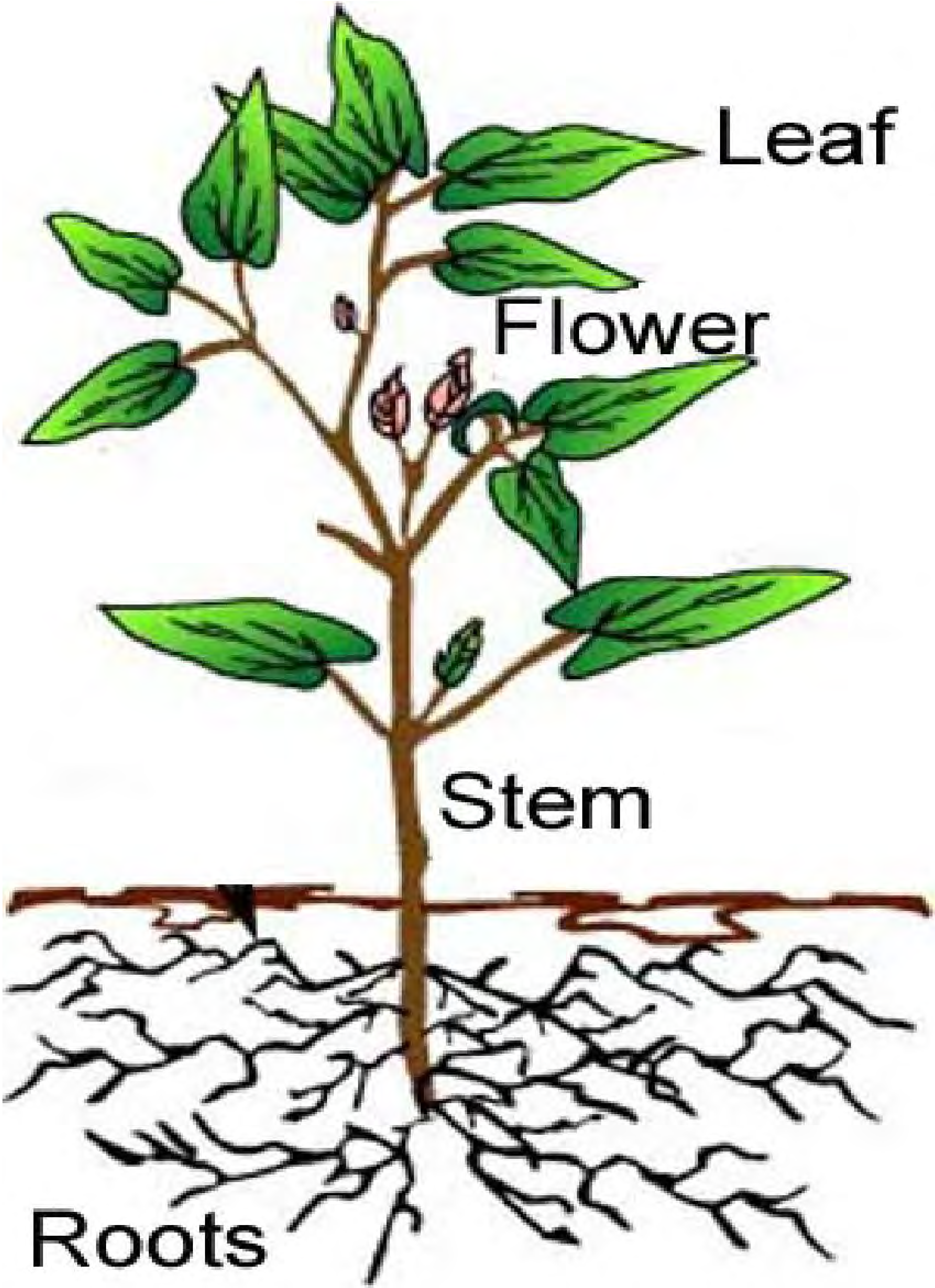
1. **Fuzzy leaves or lots of spines**

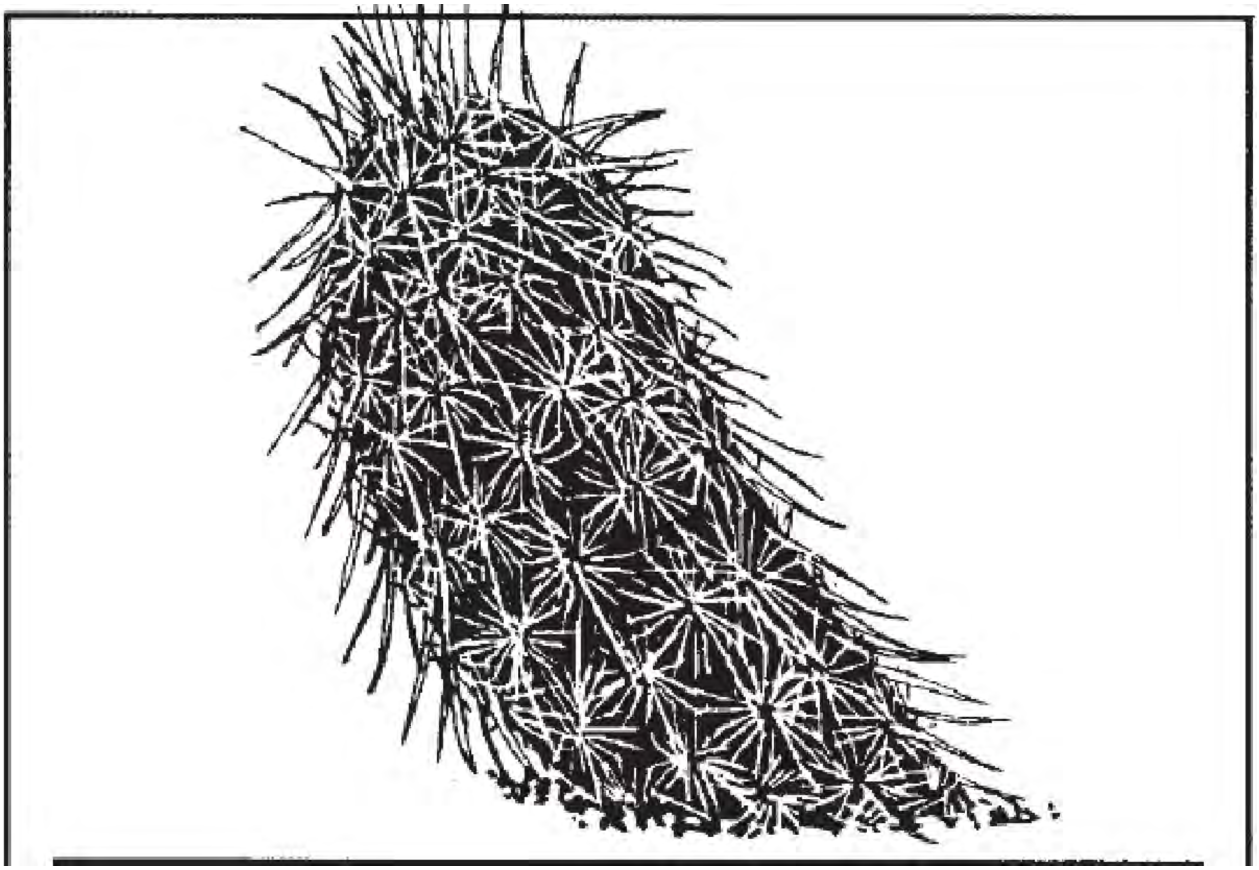
2. **Small leaves**

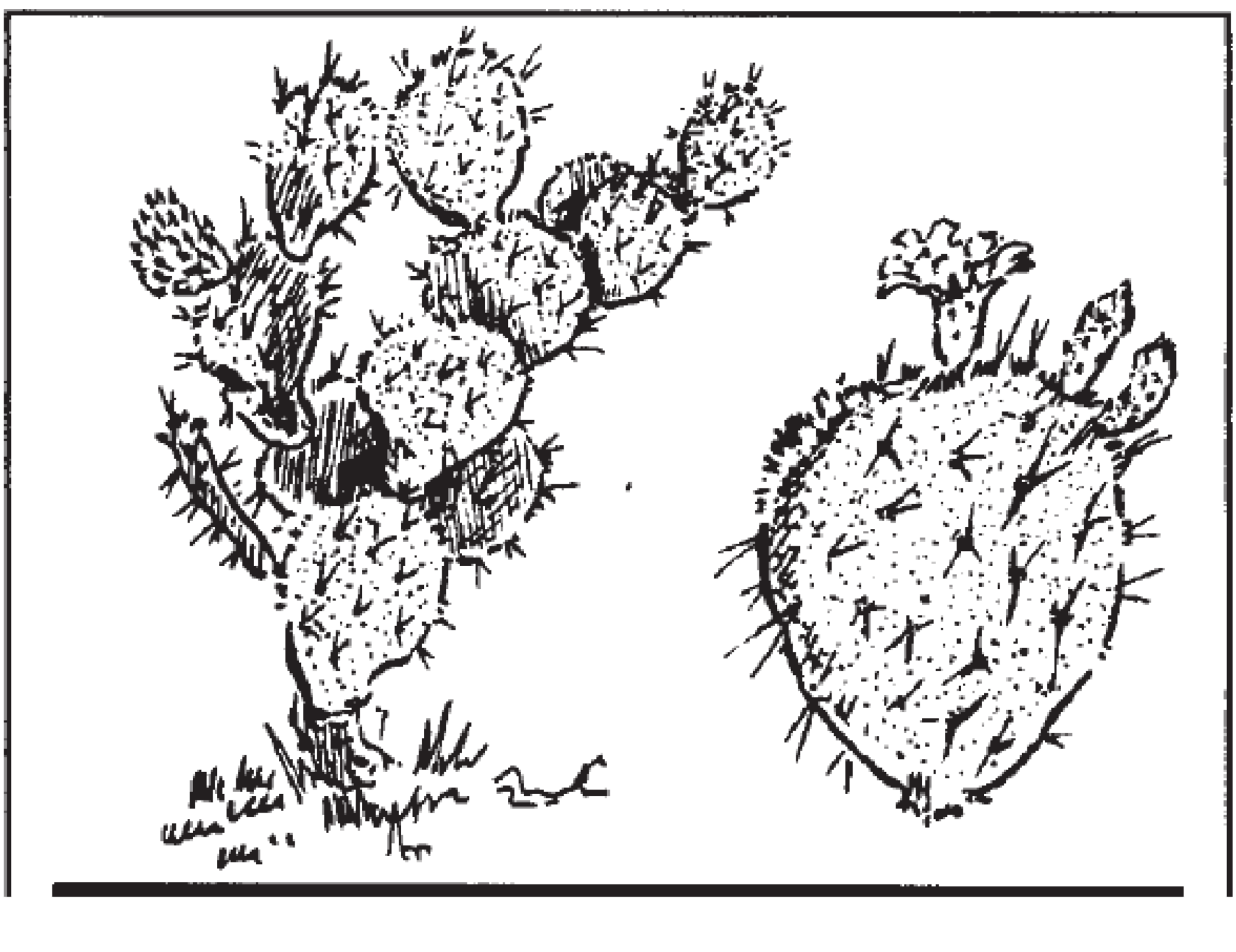
3. **Curled leaves**

4. **Waxy leaves**

5. **Green stems but no leaves!**


Leaf
Flower
Stem
Roots





Enviroscape Activity Guide for Arroyo Classroom

1. What are we trying to teach the students in this activity?
What is a watershed? How does the water cycle work? What are different forms of pollution and how does it impact our river? Arroyos lead to the river and carries different types of pollution with it.

NM State Science Standards:

3rd Grade
Water cycles through the atmosphere, plants, soil, and bodies of water in various forms.
Describe pollution and identify different types (can be naturally occurring or human made materials). Pollutants can get into our water and harm living things.
Some animals can survive better in certain environments, some will not survive at all.
Describe how roots take up water and soil nutrients, and leaves make food from sunlight.

2. How can we tie this activity to our teaching goals:

Our Goals	Where we can relate our goals to this activity
How does the water cycle work?	Describe the processes of the water cycle: evaporation, condensation, precipitation, collection, run-off and infiltration.
What is a watershed?	A watershed is all the land that drains into a river or other body of water, from mountain forests to riparian zone.
What makes water dirty?	Pollution comes from all over the watershed, and erosion is one form of pollution.
Why are arroyos important?	Arroyos provide important drainage in a storm event and provide unique and critical habitat for wildlife and plants.
How does vegetation help our river?	Forests, wetlands and healthy arroyos help keep the river clean and prevent flash floods. Plants in these areas slow the runoff of water into the river, reducing erosion and flooding. They can also remove nasty chemicals from the water by taking them up through their roots.

3. What is effective in this activity? Kids enjoy playing with the model and discussing what they are observing.

4. What makes this activity difficult to teach? Kids want to touch everything on the model and play while you are talking.

Activity Materials and Preparation

- Enviroscape model + toy houses, cars, buildings
- chocolate sprinkles to represent dog poop

- bits of paper and/or rainbow sprinkles to represent trash
- black frosting to represent oil
- sugar sprinkles or food coloring (red or green) to represent pesticides, fertilizer and/or chemicals
- Set up model
- Draw sketch of the water cycle

I. Intro – 5-10 minutes

1. What is the water cycle and how does it work? Reference the water cycle sketch and/or sing the "Water Cycle" song.
2. What is a model and what is its purpose?
3. Introduce Enviroscape as a model of a watershed. What is a watershed?
   -Describe a watershed using the metaphor of a tree (branches as arroyos, trunk as river, leaves as land, roots as ocean)
   -Introduce students to different areas on the watershed.

II. Activity – 20-30 minutes

1. What is pollution? What kind of trash/pollution have you seen in your neighborhood, local arroyo or along the street? As students are identifying different forms of pollution, place the imitation pieces on the model, as you bring their attention to different areas on the model such as residential, roadways, parking lots, farm, etc.
2. Discuss how erosion can be a form of pollution, even though dirt is natural. ***Ask students - can there be too much dirt in the river?***
3. Describe how humans have made changes to the river over the past century, such as straightening the channel, removing wetlands, building houses near it, and creating lots of impermeable surfaces such as parking lots. Note that this means faster flow and more erosion, which can make it hard for native fish to survive. Silvery minnow needs slower flow and more shallow side channels to lay its eggs, sediment can clog up fishes' gills.
4. Talk about how forests play a role in the watershed and can affect the health of a river. **Use watering cans to sprinkle water over the forest and see how it sinks in, not causing much erosion**. ***Ask students why they think this happens.*** Discuss how forests slow the runoff when it rains, because the roots hold the soil in place and take up some of the water.
5. **Farm (sediment, run-off, fertilizer, livestock waste, turbidity as a sand storm, impact on fish)**
6. **Factory (chemicals, waste, management, proximity to arroyo)**
7. **Houses - (dog poop, grease, oil, trash)**
8. **Roads (oil, trash)**
9. Observe the water's path to the river (through arroyos), and erosion below rooflines and at parking lot edges. ***Ask students what they think might be in that runoff. How would you like to drink that if you were a fish?***
10. Notice what happens to water that falls on a hard surface like a street compared to when it falls on a grassy area. Discuss the importance of vegetation. Examine the wetland and discuss how riparian vegetation slows runoff into the river, preventing flooding. **Use the watering cans to sprinkle water directly above the wetland and observe how the wetland traps some of the sediment.**
11. **On the man-made side, use berms to retain hillsides and riverbanks, add buffer strips to parking lots, and construct another wetland.** Discuss with students ways in which they can

protect and support the health of arroyos and the river.

III. Discussion – 10 minutes

- Re-emphasize the concept of a watershed.
- What can we do? Why is it important? Clean up after your dog, utilize trash cans and dispose of waste properly.
- Re-emphasize how arroyos help carry stormwater away from the places where we live, work and play and that they are connected to the river.
- Talk about the importance of keeping our arroyos clean and how to be safe when playing in and around them.

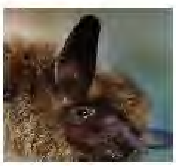
Appendix B: Supplemental Materials

-SSCAFCA Activity Book and Educational Videos:

KNOW YOUR ARROYOS

ENJOY • RESPECT • PROTECT

-SSCAFCA handouts:



Did you know?

SSCAFCA protects our community from flooding and erosion caused by big rain storms, and works to keep stormwater clean. Stormwater flows down arroyos into the Rio Grande.

Bugs like to live in stagnant water that collects in ponds and low places in the arroyos. Insects like mosquitoes can carry diseases that make us sick.

Brought to you by:

SSCAFCA

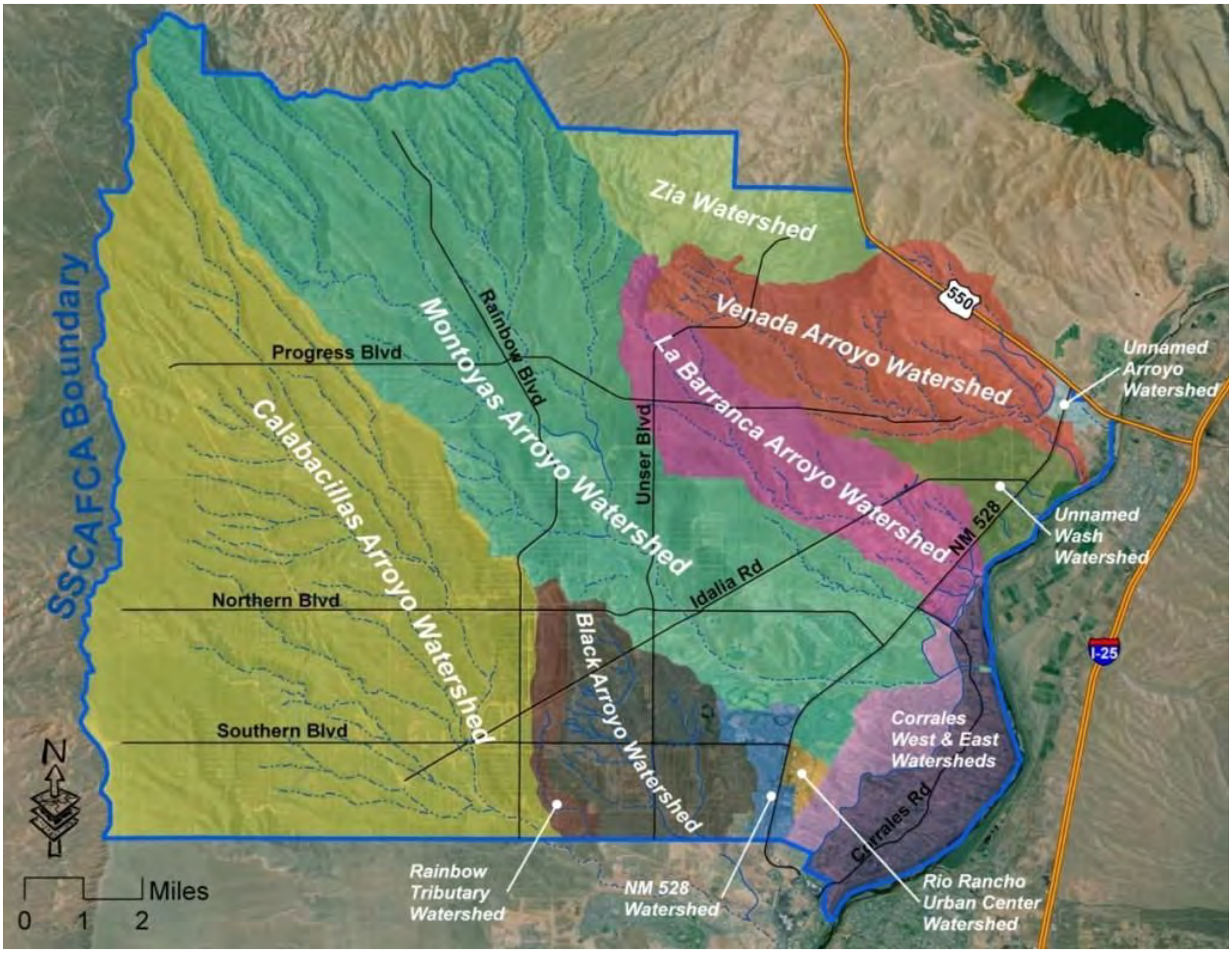
Almost all U.S. bats feed exclusively on bugs, and 1 bat can eat between 600 and 1,000 mosquitoes and other insect pests in just one hour. One bat can eat its own weight in insects in a single night!

SSCAFCA provides bat houses to encourage bats to make their homes near our arroyos, and especially near detention ponds where stormwater runoff is captured and allowed to slowly drain.

The more we help bats, the more pests they eat, so we don't have to spray pesticide that could wash down to the Rio Grande and pollute it.

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

SSCAFCA watershed map:

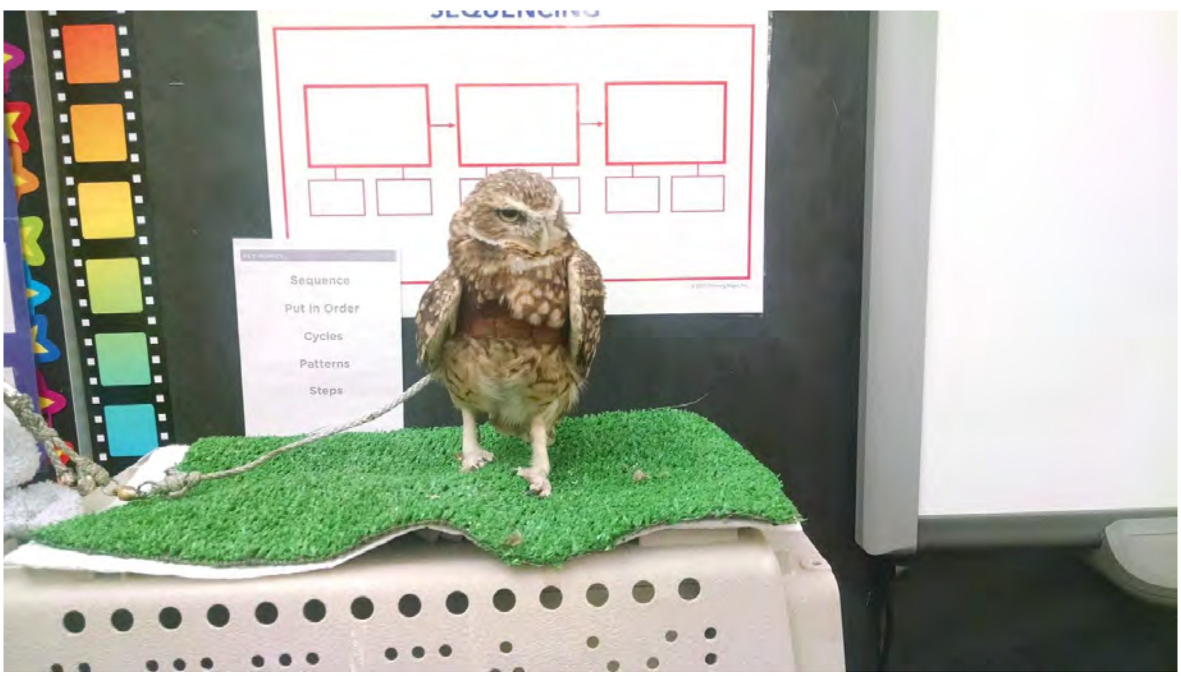


Appendix C: Program Photos

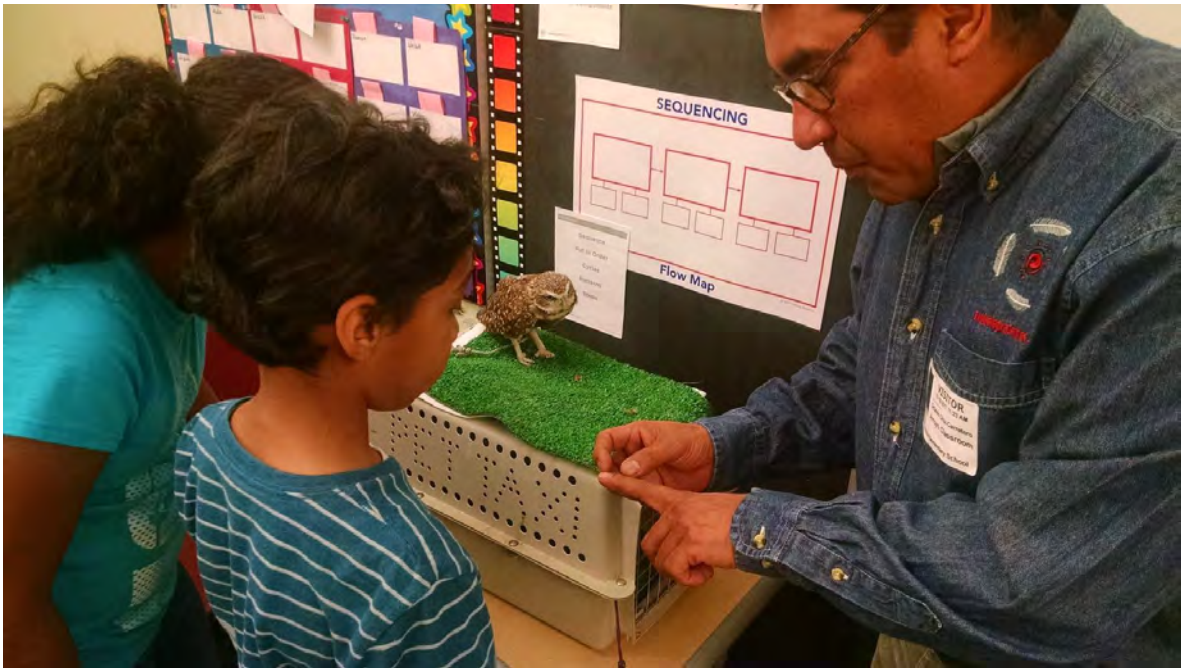
Justin Stevenson showing two microbats in rehabilitation to a class at Maggie Cordova Elementary.

Justin discussing the importance of bats and sharing video footage of their resting behavior.

Teacher at Cielo Azul Elementary disposing of trash picked up in the arroyo on the Arroyo Clean Up Day, May 17th.



Wildlife Rescue, Inc.'s burrowing owl, unable to survive in the wild, now shared for educational purposes.



Octavio Cruz elaborating on unique biological adaptations and answering questions for students at Cielo Azul Elementary.


Students at Enchanted Hills elementary pick up trash on our way back to school from the arroyo walk.

Cielo Azul Arroyo Clean Up Event - May 17, 2018	
City of Rio Rancho - Utilities Dept - coloring books, $2/ea, 150 books	$300.00
City of Rio Rancho - Parks, Rec and Community Services Dept (PRCSD) - Waste Management 40 yd dumpster, including delivery	$275.50
City of RR PRCSD- trash bags, 150, .19/ea	$28.50
City of RR PRCSD- reusable gloves, $.81/pair, 150 pairs	$121.50
88 students, 2 hours of service at $24.14/hr	$4,245.12
13 adults, 2 hours of service at $24.14/hr	$627.64
TOTAL IN-KIND	$5,598.26

Exhibit 3
RiverXchange 2017-2018

Innovative Outreach Program for Upper Elementary Students
Integrating Water Resources Topics with Language Arts & Science

2018 Report

Presented by
Ciudad Soil & Water Conservation District

June 2018

EXECUTIVE SUMMARY

This year, funding enabled 39 NM classes (1,188 students and 42 teachers) to participate. The majority of participating schools were Title I schools. Each NM class was partnered with another NM class and one or more classes outside the state for a total of over 1,412 participants. All program costs and coordination are provided free of charge to NM teachers. Training, technical support, and curriculum materials are provided free of charge to partner teachers. The program required $51,639.06 in cash and generated total match valued at $93,152.09 in the form of in-kind contributions including workshop space, classroom resources, presenters' time in the classroom, field trip docents, donated trees and shrubs as well as the teachers' and students' time.

Ciudad SWCD faced some unexpected challenges during the 2017-2018 school year. The District Coordinator, a main support for our educational programs, resigned unexpectedly in September, leaving a major gap in personnel at the start of school year. We hired on a contractor, Jessica Garduño, in December to assist with programming as needed. This change impacted the RiverXchange process flow as training for Jessica had to occur mid-school year, but we successfully completed the program at participating schools with only three exceptions (see below).

Teachers also continued to face challenges this year with mandatory computer based testing such as the PARCC test, which made it more difficult to access computer labs. We're noticing a pattern of teachers being interested in the blogging concept but having difficulty incorporating it as part of their curriculum throughout the school year.

Despite these challenges, we continue to receive feedback from teachers that they love the presentations and students learn a lot from them. Teachers enjoyed the extension activities and critical question prompts delivered after each one, commenting that it helped them further explore content with their classes. We continued to encourage group participation this school year by setting up reflection groups in each participating class, and distributing critical thinking prompts and follow-up activities to each presentation.

Most of our presenters have worked with us for years and know the program thoroughly, strengthening the correlation between their educational objectives and the goals of the RiverXchange program. We had difficulty scheduling individual presentations for our single participating online classroom and referred them to video presentations as they were available.

Program presentations were completed as follows:

Stormwater: 38/38
Drinking Water: 37/38
Wastewater: 38/38
Agriculture: 37/38
Field Trips: 37/38

We were unable to reschedule one field trip, which was cancelled by a teacher, due to mandatory testing and it being the end of the school year.

This school year, we helped fund an additional field trip for three participating classes in collaboration with US Fish & Wildlife Service. 3 RiverXchange classes also participated in USFWS Native Fish in the Classroom program and RiverXchange was able to fund the buses for their fish release. On these dates, students released approximately 130 native fish to the Middle Rio Grande, including flathead chub, longnose dace, and red shiners.

CONTENTS

PROGRAM DESCRIPTION

Mission

The mission of RiverXchange is to deepen students' and teachers' understanding and appreciation for their local river ecosystem, motivate participants to protect local water resources by conserving water and keeping their source water clean, and to provide a high quality, high impact outreach opportunity for funders and in-kind contributors.

The Big Water Questions

The optional curriculum frames program outcomes as "guiding questions," known as *Big Water Questions*. A long term goal of RiverXchange is that students understand these questions and can formulate logical, fact-based answers by the time they finish elementary school. We believe that students who can synthesize water facts to understand larger water issues will have the proper critical thinking skills and foundation for further discussion in middle and high school so that they will become informed citizens and voters on water issues.

Understanding a Watershed

- Is every place in the world part of a watershed?
- Where does your community's stormwater go?
- How can surface water become polluted?
- How does the water cycle relate to weather?
- How are groundwater and surface water connected?
- How can groundwater become polluted?
- What actions can all of us take to keep water clean?

Water in Our Society

- In what ways does our society use water?
- Where does your community's drinking water come from?
- Does everyone have the right to use as much water as they want?
- Where does your community's wastewater go?
- What actions can all of us take to conserve water?

River Ecosystem

- How does water affect living things in an ecosystem?
- What role do forests play in a watershed?
- What role do wetlands play in a watershed?
- What are some of the ways scientists can determine the health of a river, lake, bay or ocean?
- What actions can all of us take to improve the health of our ecosystem?

Background

As producers of children's water festivals and other grade K12 water resources outreach in NM since 2007, we observed early on that NM elementary teachers rarely incorporated water concepts in the classroom beyond what is required by the state (e.g., water cycle), and that most elementary teachers considered "water" strictly as a science topic. While teachers personally acknowledged the importance of conserving water and keeping source water clean, we continued to find that upper elementary students had little or no understanding of major water resources topics unless the teacher specifically integrates a wide range of water topics into the curriculum. For this reason, as well as our successful festival work with upper elementary students, this age level was selected as the focus for the RiverXchange program.

We created RiverXchange to provide a free program that is fun, interesting, and easy to integrate into the normal curriculum. Our hope was to motivate participants to explore water resources topics in depth. The program is carried out over eight months so that students spend more time developing a sense of pride and personal connection to their own river ecosystem, as well as a personal connection to a distant river ecosystem and the students who live near it.

RiverXchange began in 2007 as a pilot project of Experiential EE, LLC (under a services agreement with the New Mexico Water Conservation Alliance) and the National Great Rivers Research and Education Center, featuring partnerships between two fourth grade classes in Albuquerque, NM, and two fifth grade classes in Godfrey, IL. A curriculum was developed, a field trip to the river was coordinated, and partner classes "met" three times during the year via video tele-conferencing to present what they had learned. The upper elementary level was chosen because of our successful festival work with this age group.

After the pilot project, we transitioned to a web-based technology called a wiki. This enabled us to overcome limitations such as the high cost, availability, and time zone logistical issues associated with video teleconferencing – and easily involve more classes. The curriculum was updated to incorporate the writing component and we introduced classroom guest speakers to reduce teacher workload and bring up-to-date technical information into the classroom.

In 2012, ownership of RiverXchange transferred to Amy White of Orilla Consulting, LLC, who managed the program through July 2015. In August 2015, RiverXchange became part of the Ciudad Soil & Water Conservation District. Since 2007, we have served nearly 17,000 students!

This year, the program featured the following components:

- Optional standards-based curriculum including hands on science and social studies lessons, as well as writing assignments
- Coordination of class partnerships
- KidBlog online posting and communication
- Teacher training on curriculum implementation and use of KidBlog
- Ongoing technical and motivational support
- Online class postings
- End of year teacher survey
- Pre and post student surveys (NM only)
- Payment for teacher workshop substitute teachers (NM only)

- Coordination of at least four guest speakers into the classroom (NM only)
- Coordination of a field trip to the local river or important watershed feature (NM only)
- Field trip bus transportation payment (NM only)
- Field trip leadership and activity planning (NM only)

Program Management and Financial Support

The program timeframe was July 1, 2017 through June 30, 2018. All components including fundraising, design, planning, implementation, and analysis were carried out by employees and contractors of Ciudad Soil & Water Conservation District, including:

Jennifer Moss
Connie Crandall
Melissa McLamb
Jessica Garduño

Sponsors

- Southern Sandoval County Arroyo and Flood Control Authority
- Middle Rio Grande Stormwater Quality Team

Sponsors provided $51,639.06 in cash. Program expenses included:

- Substitute teachers for NM teacher workshops
- Teacher workshop space rental and meals
- Field trip bus transportation for NM classes
- Field trip portable toilet rentals for NM classes
- Technology services
- Office supplies
- Coordination services (planning, implementing and assessing all program components)

New Mexico In-Kind Partners

- Albuquerque Water Utility Authority
- Bernalillo County Cooperative Extension, 4H
- Bernalillo County - Master Naturalist Program
- Bernalillo County - Public Works Division
- Bosque Ecosystem Monitoring Program
- CDM Smith, Inc.
- City of Albuquerque – Open Space Division
- City of Rio Rancho – Environmental Programs Office
- City of Rio Rancho — Parks, Recreation and Community Services Department
- Daniel B. Stephens and Associates
- New Mexico Museum of Natural History and Science
- Sandoval County Cooperative Extension
- Southern Sandoval County Arroyo and Flood Control Authority

In-Kind contributions totaled $93,152.09. For NM classes, in-kind contributions included classroom guest speakers, field trip docents, planting materials, workshop space and computer lab use, classroom resources, and teachers' and students' time attending the presentations and field trips. For partner classes, in-kind contributions were not calculated this year. Sponsors and in-kind partners were recognized on our website and in presentations.

Participant Selection

All 39 participating NM classes were fifth grade classes, distributed as follows:

Bernalillo County	**Sandoval County**
Bandelier Elementary (2 classes)	Colinas del Norte Elementary (5 classes) *
Cochiti Elementary (2 classes) *	Martin Luther King, Jr. Elementary (6 classes)*
Duranes Elementary *	Rio Rancho Elementary School (4 classes) *
Georgia O'Keeffe Elementary (3 classes)	Sandia Vista Elementary (1 class)
John Baker Elementary (4 classes)	Bernalillo Elementary (1 class) *
Monte Vista Elementary (3 classes)	Placitas Elementary (1 class)
Osuna Elementary (3 classes)	
Zia Elementary (1 classes) *	
NM Connections (Online statewide class)	
20 classes, 612 students	**19 classes, 576 students**
* Title 1 school	

All but one partner classes were located in the continental United States, the other was located in South Africa. Partner classes included approximately 308 students and 14 teachers. We have found that partner teachers are highly motivated and come to the program with a willingness to participate even though our NM based funding cannot be used to help coordinate their classroom guest speakers, arrange a field trip, or pay for any direct costs.

Teacher Professional Development Workshop

Although preparation began many months earlier, RiverXchange officially kicked off in October with two teacher workshops for NM teachers and online training sessions for partner teachers. Teachers learned how to implement the activities in the curriculum and how to operate and manage their class blog.

This year, educators from Bosque Ecosystem Monitoring Project gave a professional development talk to RiverXchange teachers, emphasizing ways to incorporate environmental education and citizen science projects into the classroom.

KidBlog Technology

One of the challenging aspects of program implementation continued to be the training of teachers on how to use the KidBlog and encouraging them to do so throughout the year. This was our second year using Reflection Groups for blogging and activities. These groups minimize teachers' time in monitoring posts. To strengthen learning outcomes in the future, educators intend to coordinate presentations over a shorter time frame (3-4 months) and assist classrooms with 1-2 posts throughout the program.

Online Partner Training

Many teachers contacted us if they had technical difficulties and we also checked in with many of them mid Fall to answer any questions and troubleshoot any issues.

Curriculum

A component of RiverXchange is the hands on optional curriculum, which is offered to all participating teachers. It was developed to help students reach for deeper meaning through hands-on learning and reinforce what they have learned through the process of writing to their pen pals. Organizers strive to incorporate emerging water resources issues into the curriculum, increase networking opportunities for teachers, reduce teacher workload, and align the curriculum with public school curriculum priorities.

Each class learns about its own local water resources issues through hands-on activities, classroom guest speakers, and a field trip. Students write about what they are learning via a private educational website that can be viewed by their partner classes. The computer technology and writing components provide a unique opportunity to reinforce what was learned, increase student motivation to learn, and collect valuable metrics about student performance.

Through RiverXchange, students take pride in sharing their knowledge of the local ecosystem and learning from their peers about another river ecosystem. Comparing the two geographical areas gives students a broader understanding of the importance of a river ecosystem to human and other life. Students gain the unique opportunity to share personal experiences and ask questions about a distant place. Teachers feel this kind of personal connection is a big deal for kids – many of whom have never traveled beyond their city limits.

All activities are correlated to NM state standards and benchmarks for Science and Social Studies. All activities (because they require that students communicate information on the KidBlog) address Common Core Language Arts standards for writing. Some activities also address Common Core Mathematics and Science standards. For a summary of the RiverXchange Curriculum, see Appendix 1**.**

Guest Speakers

We coordinated four guest presentations to visit each NM classroom. In all cases, guest speakers were water resources professionals from local agencies. Topics included:

- watershed/nonpoint source pollution

- drinking water
- wastewater
- water and agriculture

Field Trips

The program requires that all classes attend at least one field trip to their local river or important watershed feature, which should incorporate a service learning component if possible. We coordinated all NM field trips. Throughout the winter and spring, students planted over 500 native trees and shrubs and helped restore critical riparian habitat along the Rio Grande in Albuquerque. Several spring field trips included a water quality monitoring component.

<u>New Mexico Field Trip Locations</u>

Gabaldon Trailhead- Open Space

Managed by City of Albuquerque Open Space, this property is located on the east side of the Rio Grande, immediately north of I-40 and Rio Grande Blvd. While students planted native trees, they learned about the history of the Bosque, the significance of invasive species and conservation efforts, and observed porcupines, sandhill cranes, coyotes and other bosque animals.

Tingley Wetland

This 18 acre tract, adjacent to the Bosque in downtown Albuquerque, is owned by the City of Albuquerque, and features a restored constructed pond and peripheral wetlands including native and nonnative aquatic habitat. Students took a hike into the Bosque, observed macroinvertebrates and tested water quality.

<u>Partner Field Trip Locations</u>

Since program funding is NM based, we were not able to assist partner teachers with coordinating a field trip; however, we did provide partner teachers with names of agencies located in most parts of the U.S. that may be able to assist. We know that many of them implement water quality testing. Many also go on field trips to relevant places including water treatment plants, local reservoirs, dams and river/watershed museums.

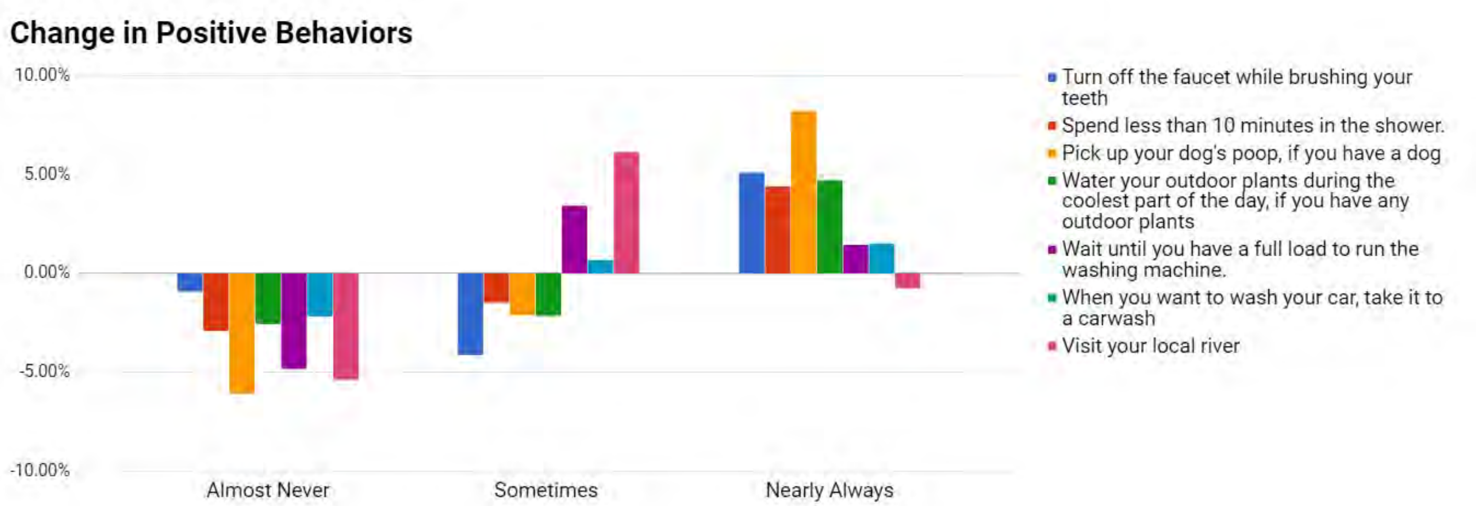
Evaluation

Student Surveys

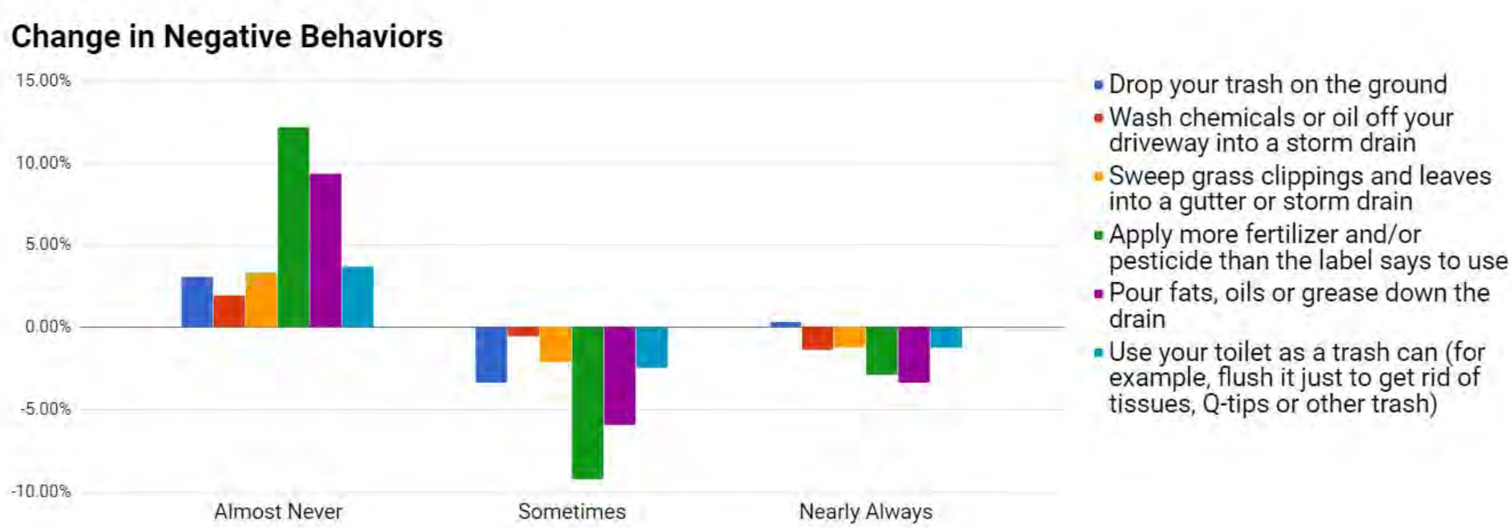
A key component of RiverXchange is its measurable goals relating to student performance. We collected quantitative data on student performance by way of a pre and post survey and qualitative data by reading what students submitted on KidBlog. We also surveyed students about their actions before and after participating in RiverXchange.

<u>Pre/Post Behavior Survey</u>

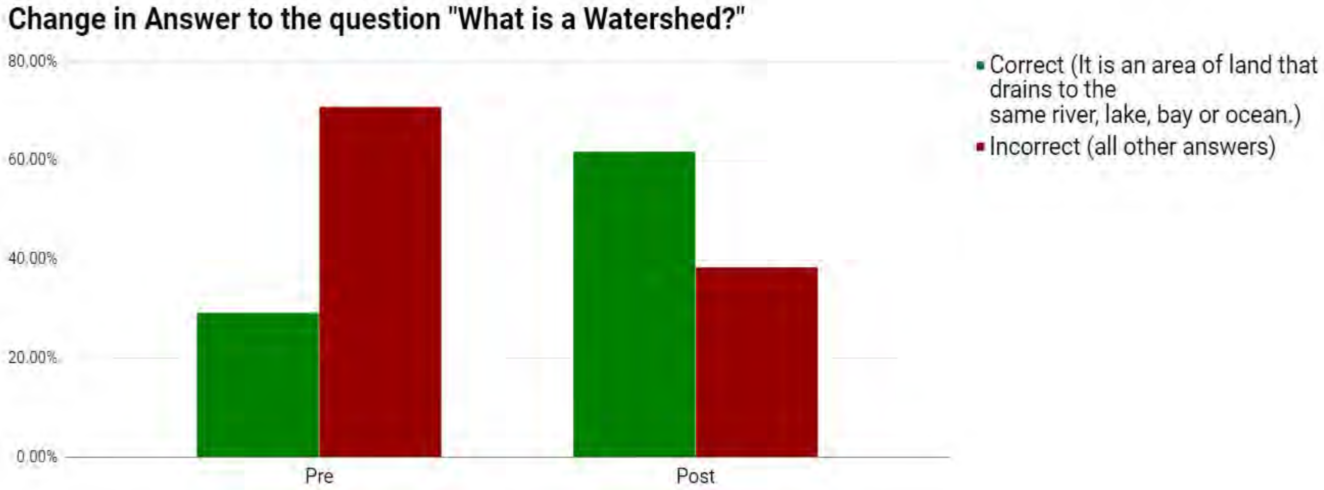
In order to quantify the learning outcomes achieved through RiverXchange, we ask our teachers to have their students fill out a survey prior to, and upon completion of the program. Below, you will find a series of graphs used to illustrate the change in responses between the pre and post surveys. This year, 812 students completed the pre-survey, while 623 completed the post-survey. In order to account for this discrepancy in participation, the number of each given answer has been calculated as a percent of the total number of responses received for each given survey. We continue to refine the survey and our programming year after year based on teacher feedback and metrics gathered from these surveys.

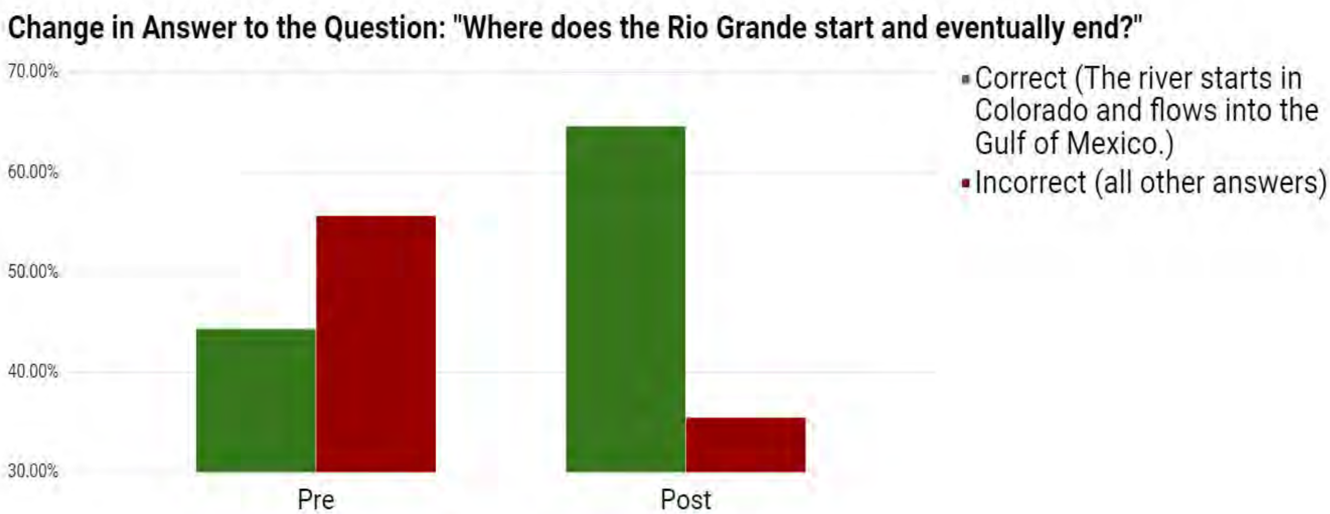


This graph illustrates a significant increase in all the above listed positive behaviors after having received the RiverXchange presentations. For example, the question "How often do you pick up your dog's poop?" saw a 6.1% decrease in the answer "almost never," and an 8.21% increase in the answer "nearly always."

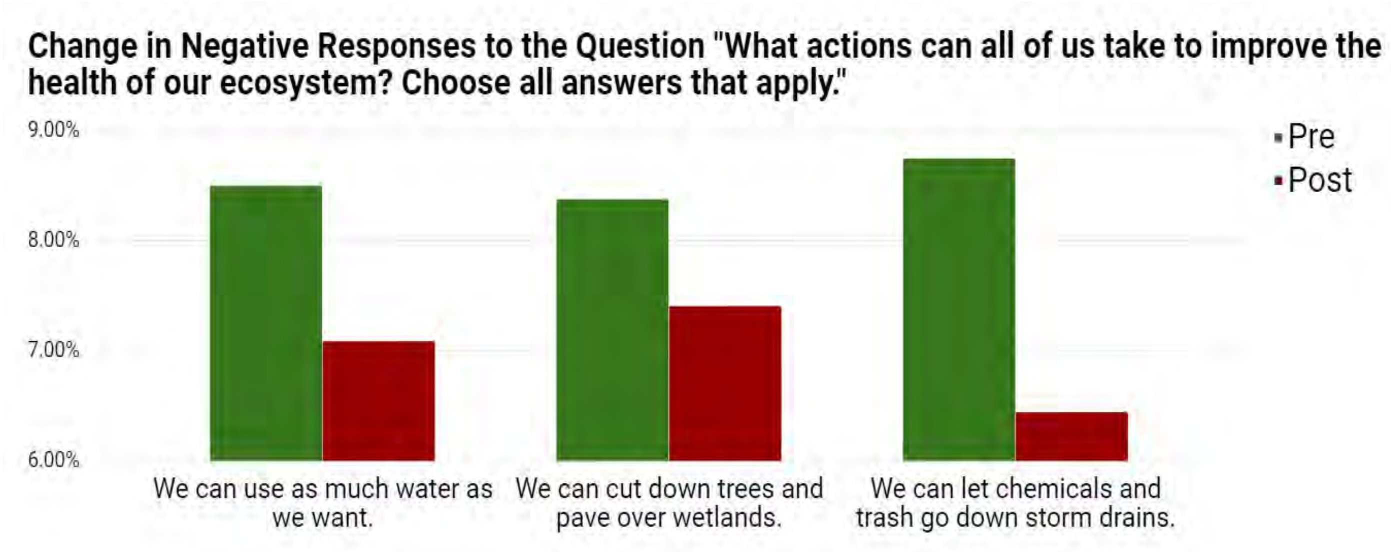


This graph illustrates a significant decrease in all the above listed negative behaviors after having received the RiverXchange presentations. For example, the question "How often do you apply more fertilizer and/or pesticide than the label says to use?" saw a 9.25% decrease in the answer "sometimes," and an 12.17% increase in the answer "almost never."

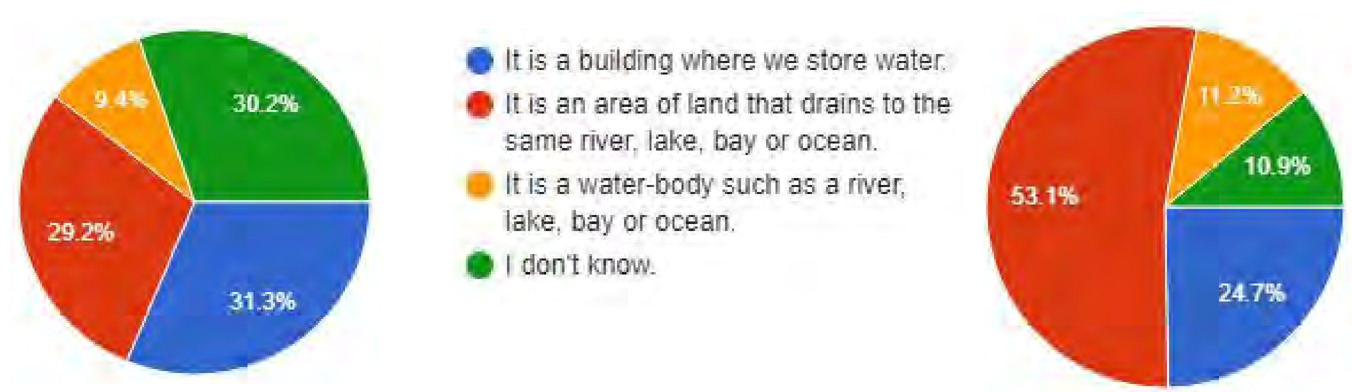

Change in Answer to the question "What is a Watershed?"
80.00%
60.00%
40.00%
20.00%
0.00%
Pre
Post
Correct (It is an area of land that drains to the same river, lake, bay or ocean.)
Incorrect (all other answers)


Change in Answer to the Question: "Where does the Rio Grande start and eventually end?"
70.00%
60.00%
50.00%
40.00%
30.00%
Pre
Post
Correct (The river starts in Colorado and flows into the Gulf of Mexico.)
Incorrect (all other answers)


Change in Positive Responses to the Question "What actions can all of us take to improve the health of our ecosystem? Choose all answers that apply."
90.00%
80.00%
70.00%
60.00%
50.00%
We can conserve water so that there is more water left for wildlife and plants.
We can study the ecosystem to understand what is happening.
We can plant native plants and create wetlands.
Pre
Post



What is a watershed (also known as a catchment or drainage basin)?

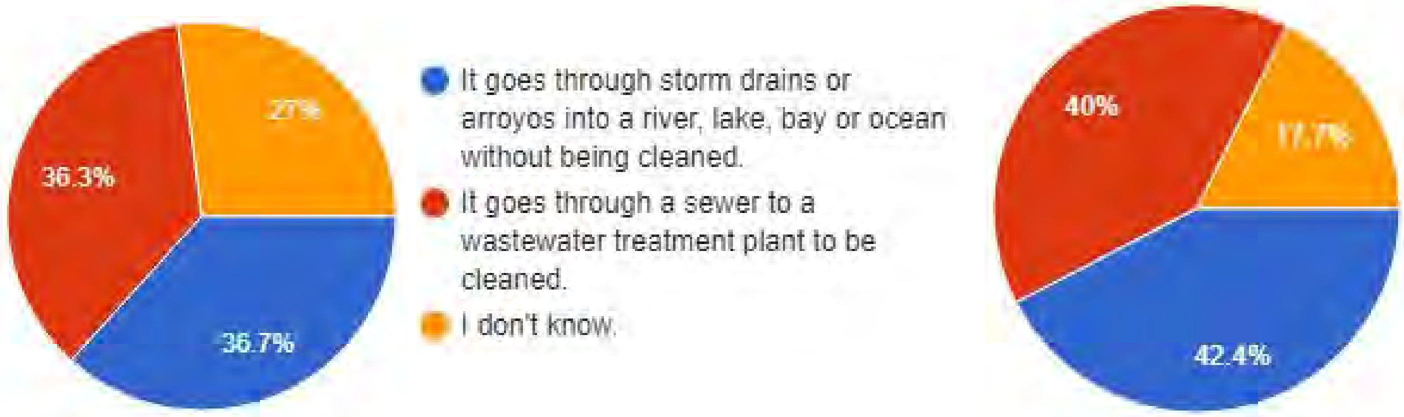


Pre **Post**

How much precipitation does your community receive each year?

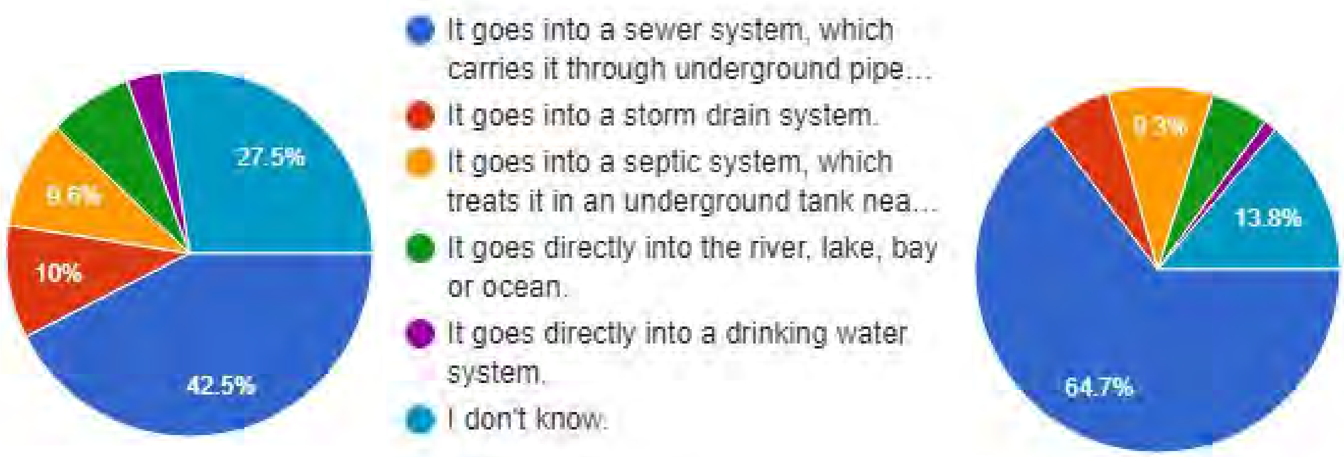
Pre **Post**

When it rains, where does your community's stormwater go?



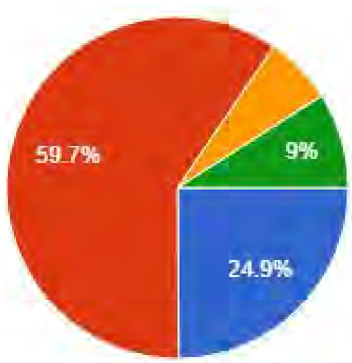
Pre **Post**

Where does your community's wastewater go?



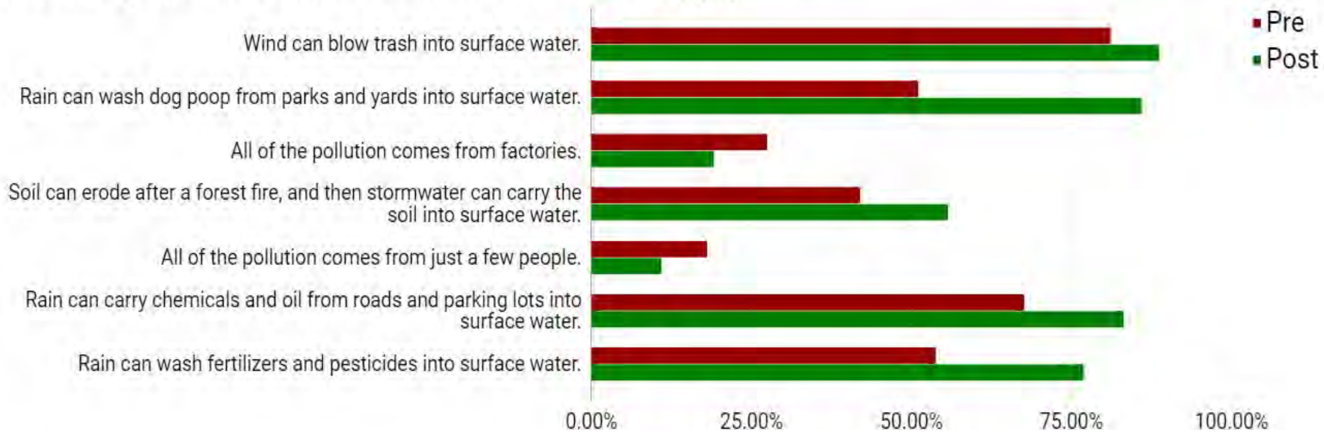
Pre **Post**

Does everyone have the right to use as much water as they want?

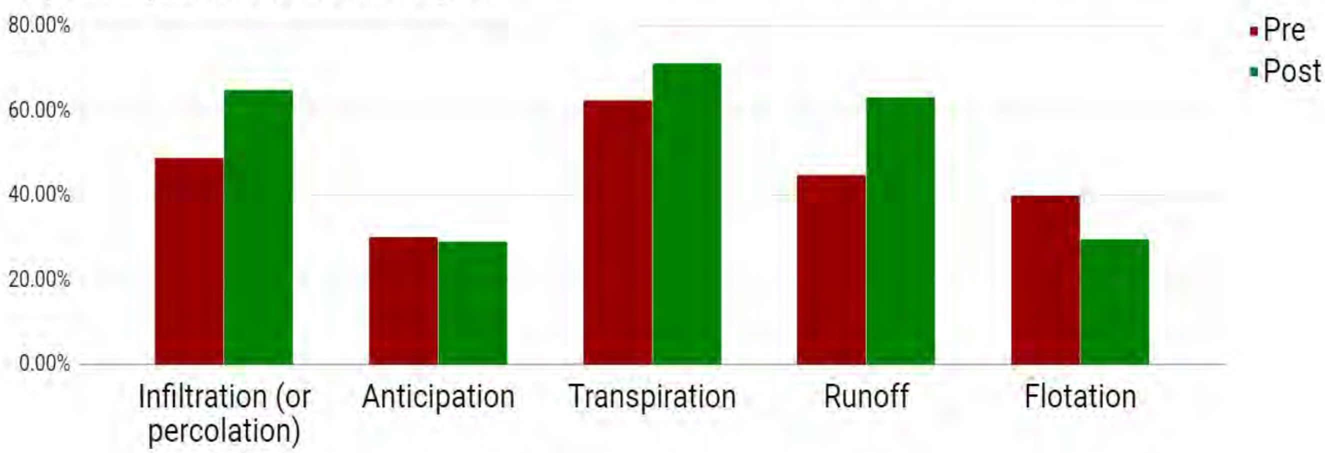


Pre **Post**

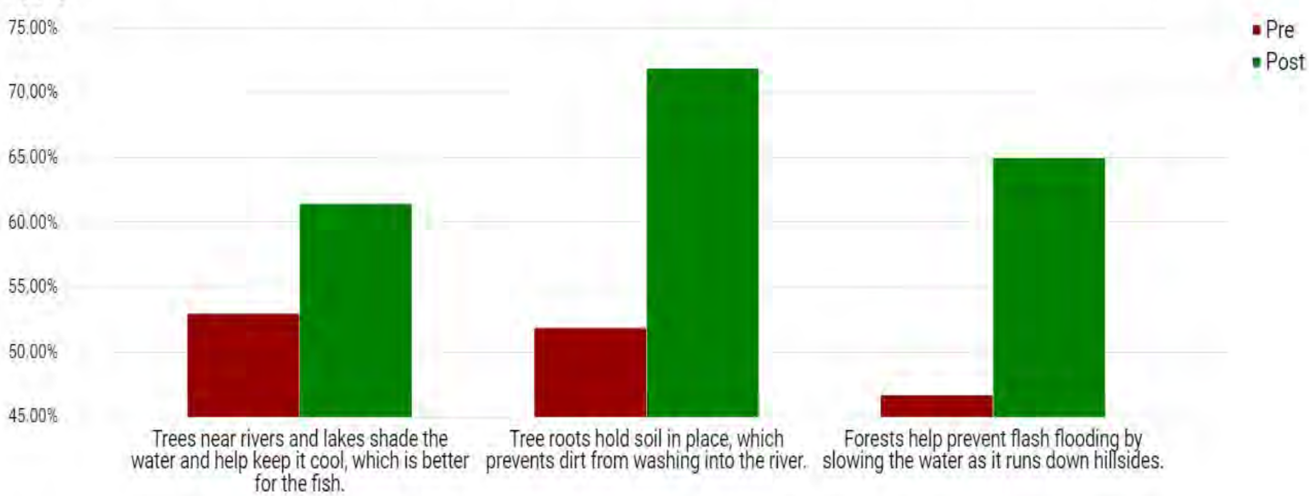
Responses to the Question: "How can surface water (like a river, lake, bay or ocean) become polluted? Choose all answers that apply."

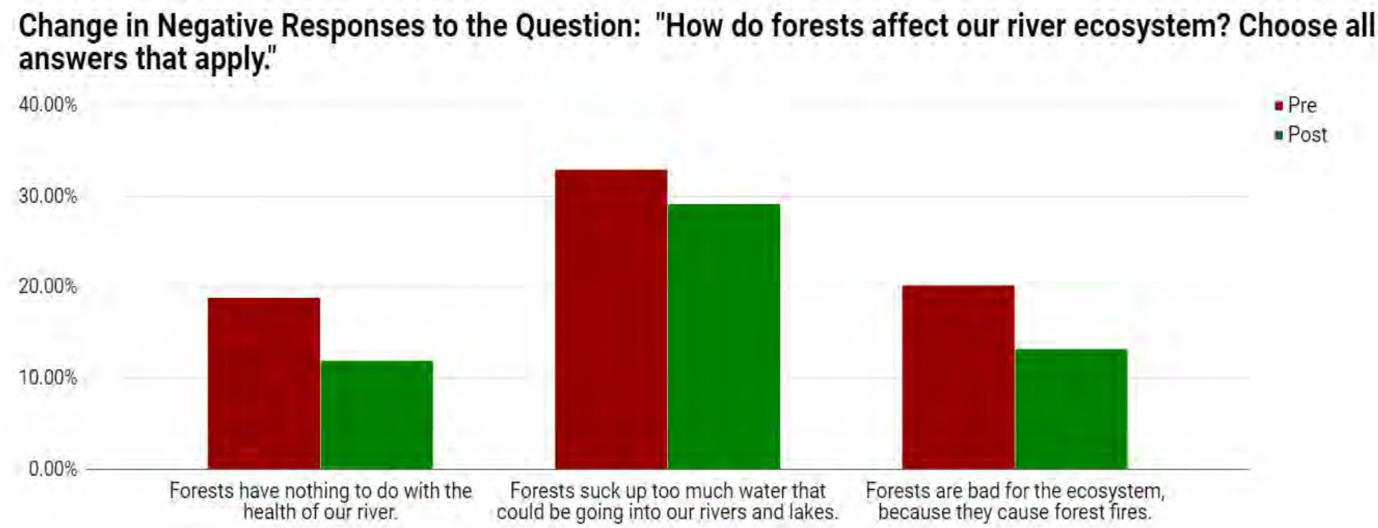


Responses to the Question: "Along with condensation, evaporation and precipitation, identify three other major components of the water cycle."

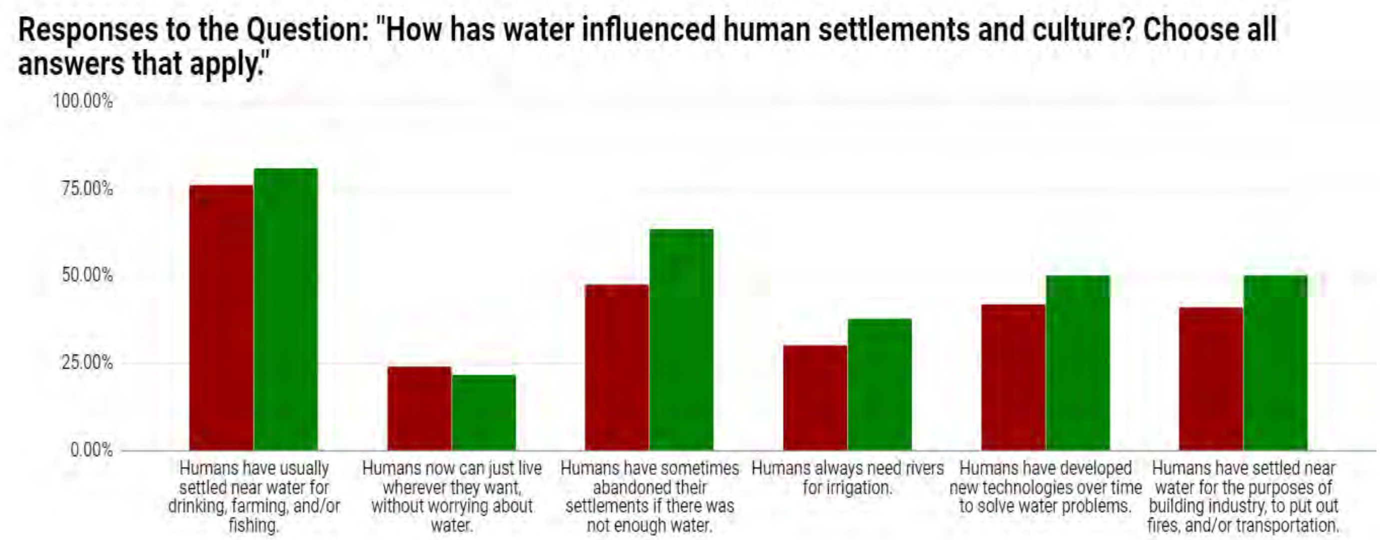


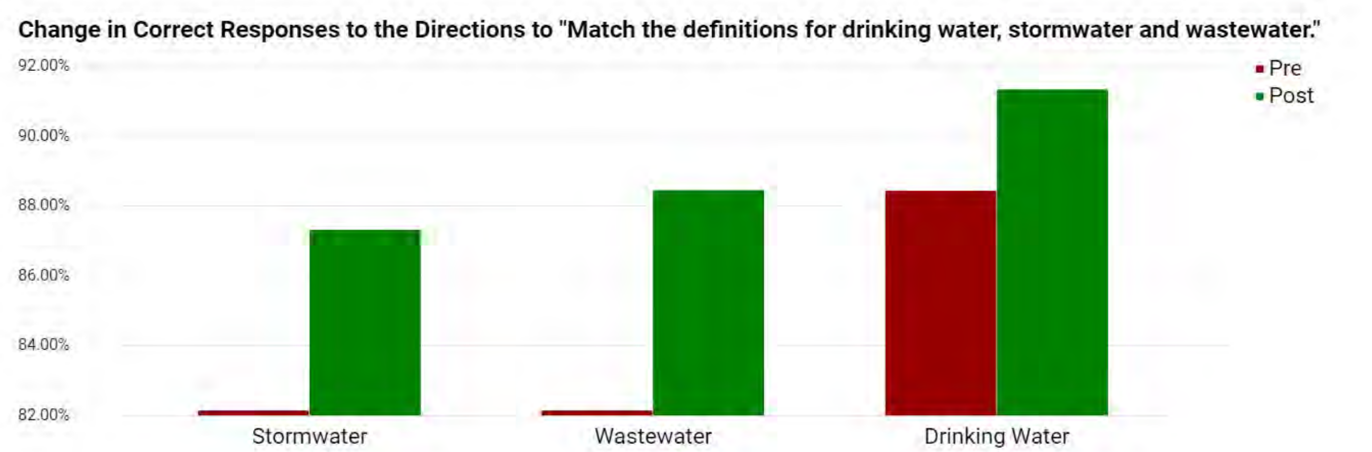
Change in Positive Responses to the Question: "How do forests affect our river ecosystem? Choose all answers that apply."

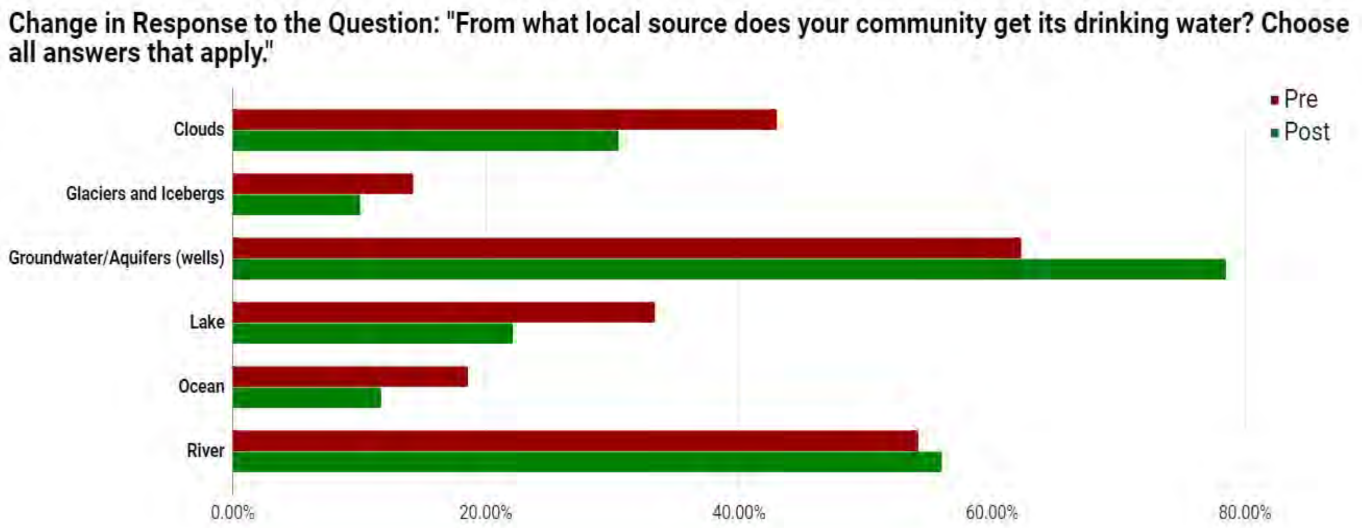


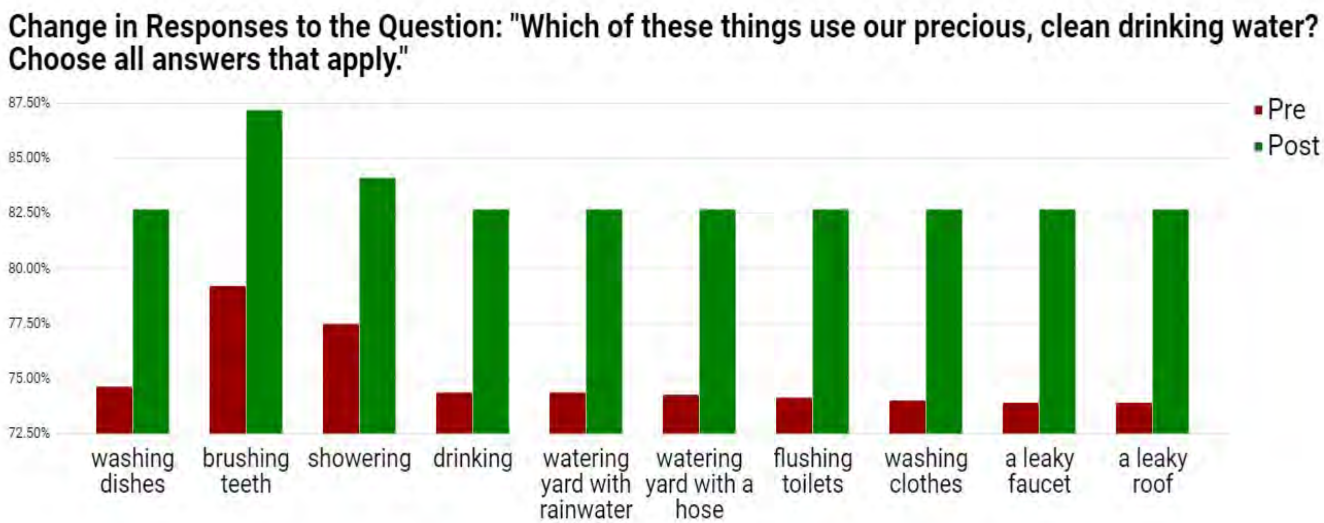


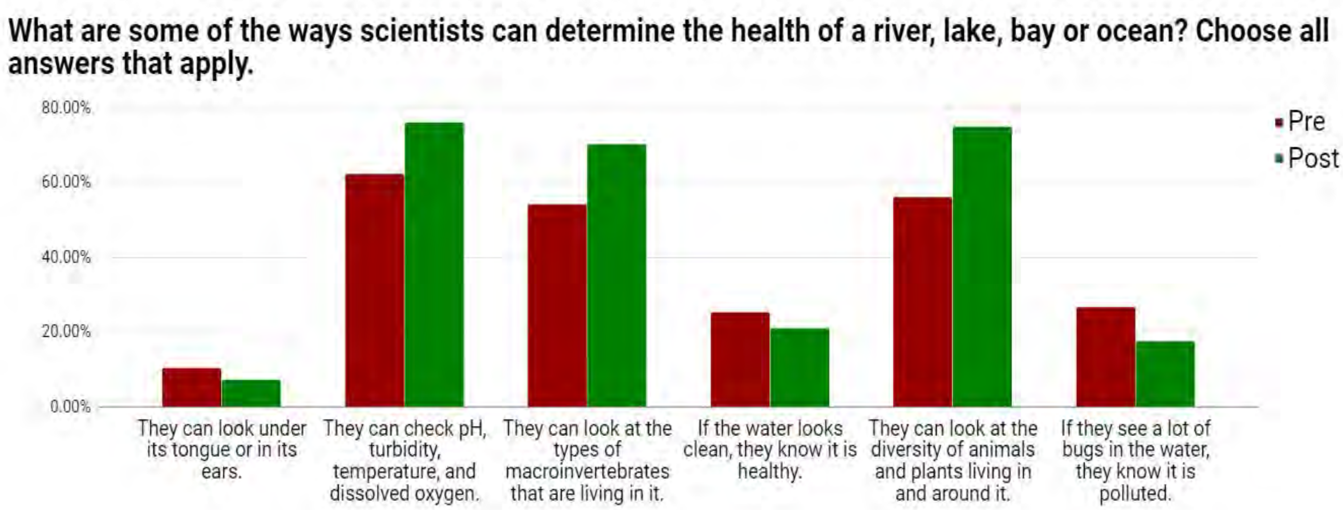
This decrease in negative responses indicates that our students have gained a better understanding of the effects of forests on our river ecosystem after participating in RiverXchange.



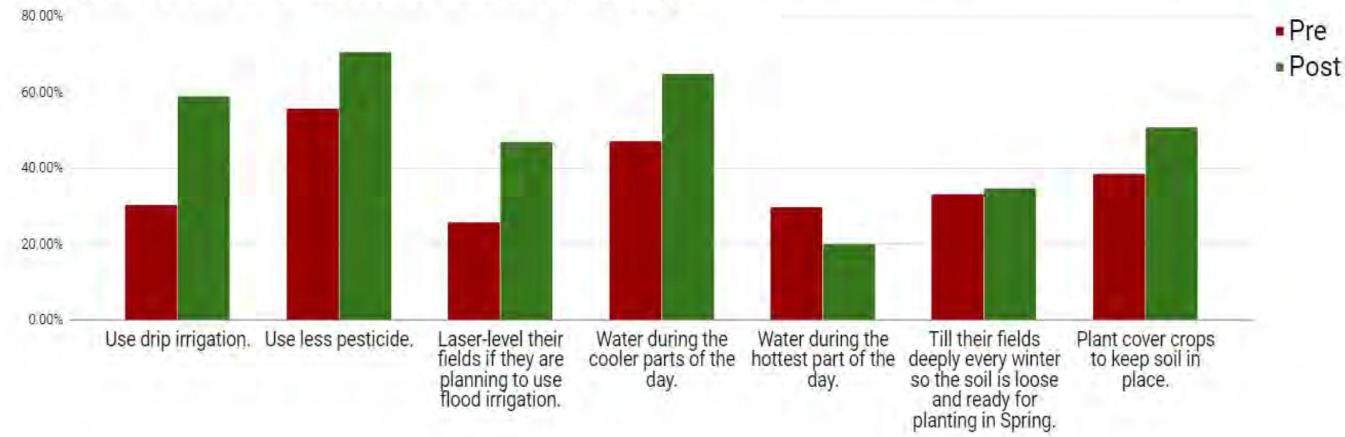



Change in Response to the Question: "From what local source does your community get its drinking water? Choose all answers that apply."
Pre
Post
Clouds
Glaciers and Icebergs
Groundwater/Aquifers (wells)
Lake
Ocean
River
0.00%
20.00%
40.00%
60.00%
80.00%

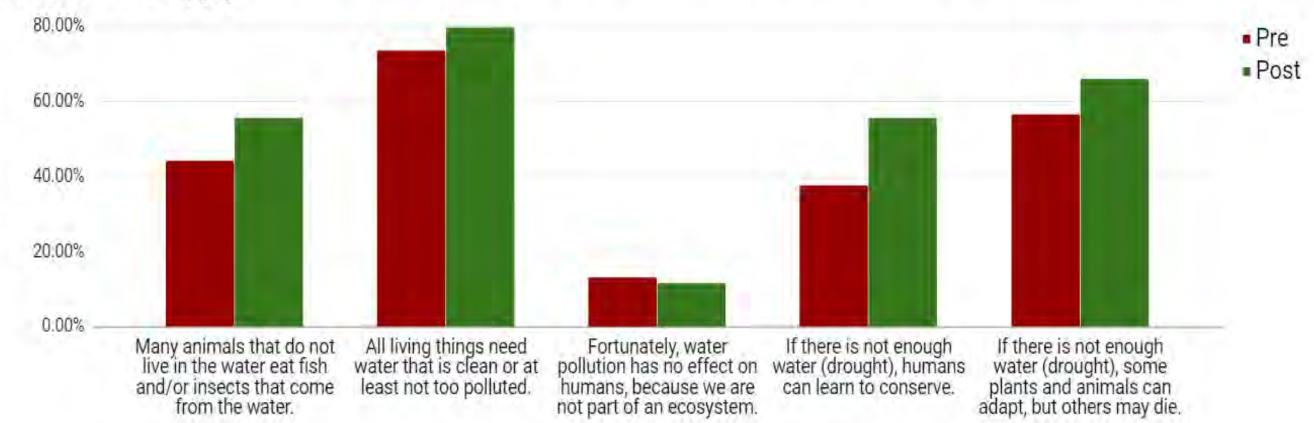

Change in Responses to the Question: "Which of these things use our precious, clean drinking water? Choose all answers that apply."
Pre
Post
87.50%
85.00%
82.50%
80.00%
77.50%
75.00%
72.50%
washing dishes
brushing teeth
showering
drinking
watering yard with rainwater
watering yard with a hose
flushing toilets
washing clothes
a leaky faucet
a leaky roof


What are some of the ways scientists can determine the health of a river, lake, bay or ocean? Choose all answers that apply.
Pre
Post
80.00%
60.00%
40.00%
20.00%
0.00%
They can look under its tongue or in its ears.
They can check pH, turbidity, temperature, and dissolved oxygen.
They can look at the types of macroinvertebrates that are living in it.
If the water looks clean, they know it is healthy.
They can look at the diversity of animals and plants living in and around it.
If they see a lot of bugs in the water, they know it is polluted.

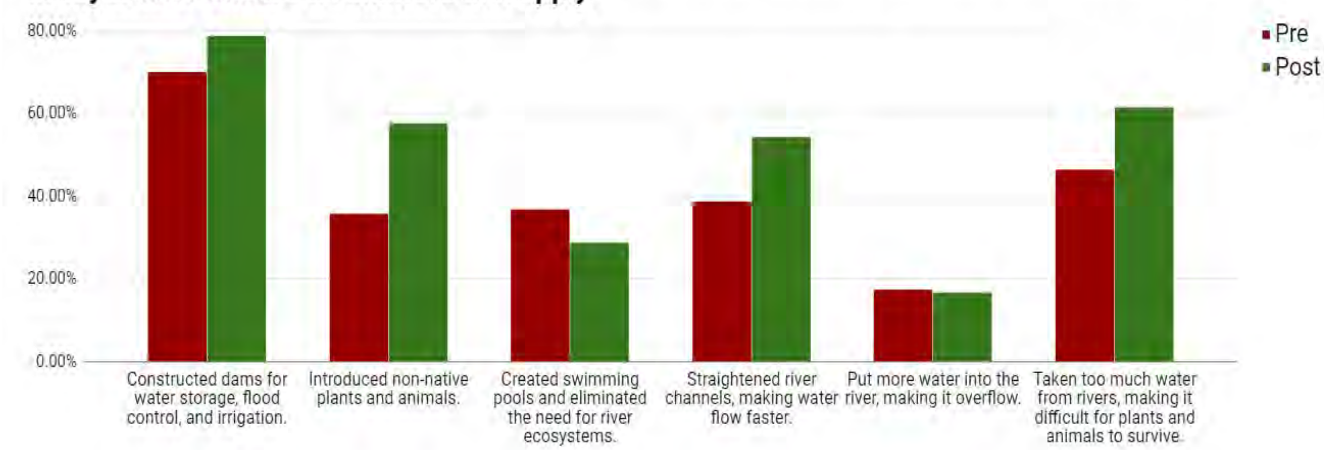
Change in Responses to the Question: "What can farmers do to conserve water or prevent pollution of our water resources? Choose all answers that apply."

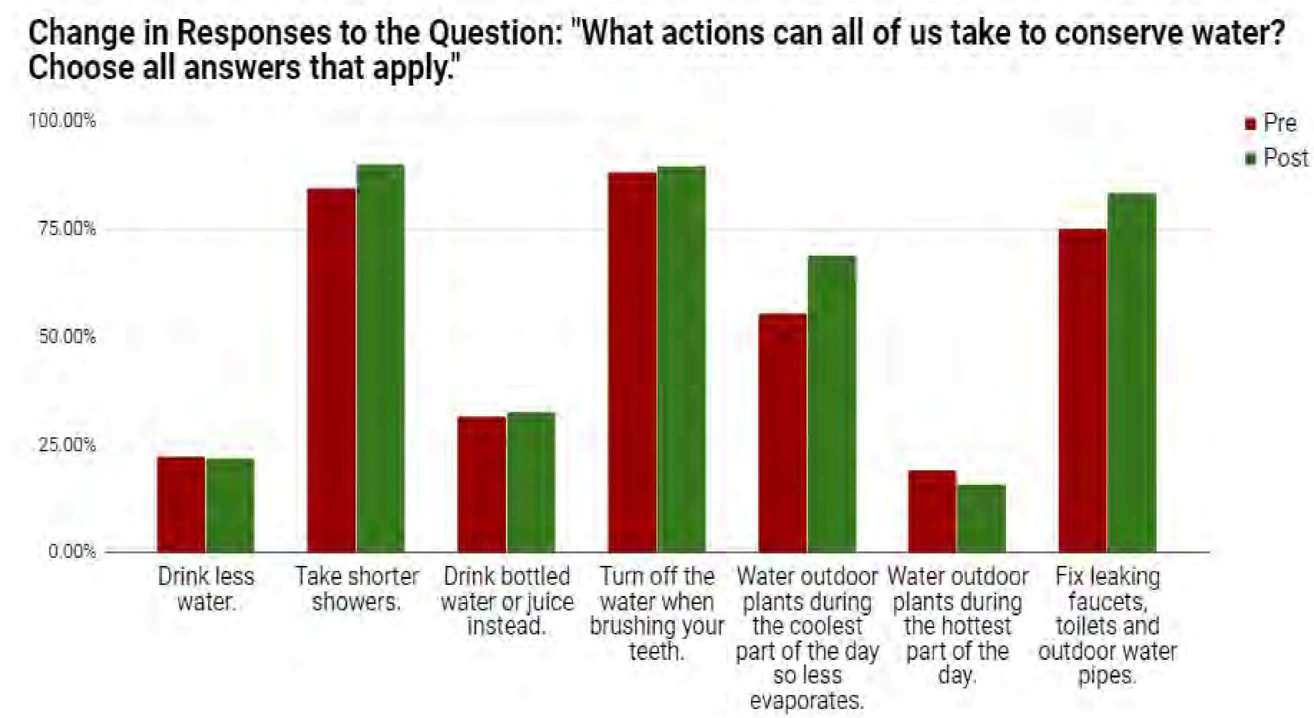


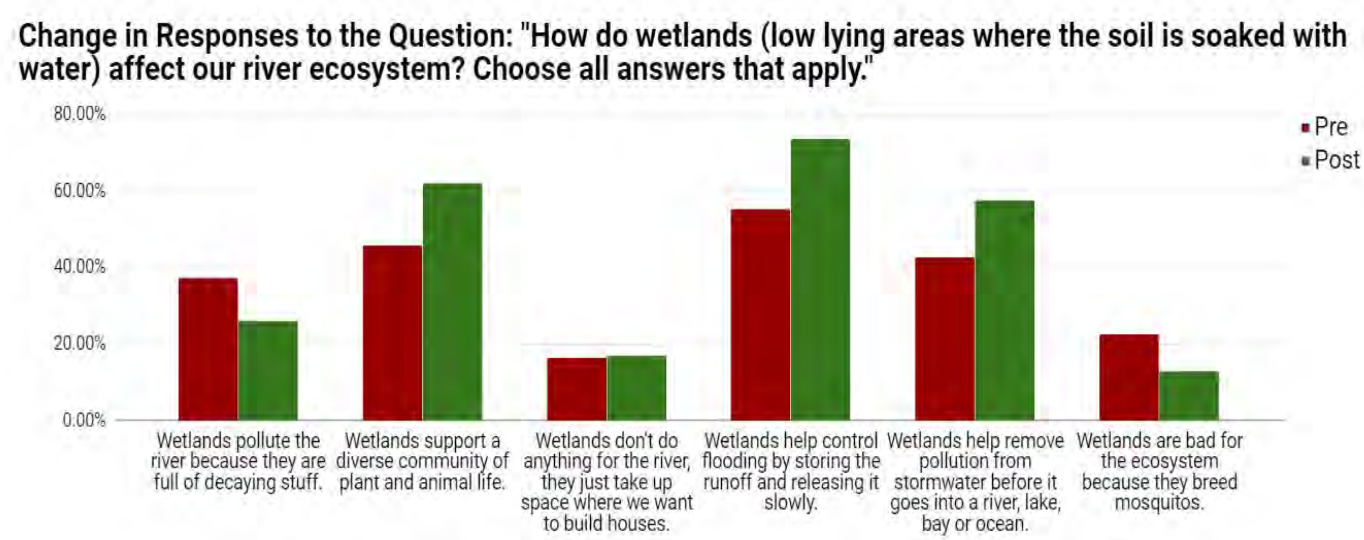
Change in Response to the Question: " How does water affect living things in an ecosystem? Choose all answers that apply."



Change in Responses to the Question: "What are some of the ways that humans have changed river ecosystems? Choose all answers that apply."




Change in Responses to the Question: "What actions can all of us take to conserve water? Choose all answers that apply."
100.00%
75.00%
50.00%
25.00%
0.00%
Pre
Post
Drink less water.
Take shorter showers.
Drink bottled water or juice instead.
Turn off the water when brushing your teeth.
Water outdoor plants during the coolest part of the day so less evaporates.
Water outdoor plants during the hottest part of the day.
Fix leaking faucets, toilets and outdoor water pipes.


Change in Responses to the Question: "How do wetlands (low lying areas where the soil is soaked with water) affect our river ecosystem? Choose all answers that apply."
80.00%
60.00%
40.00%
20.00%
0.00%
Pre
Post
Wetlands pollute the river because they are full of decaying stuff.
Wetlands support a diverse community of plant and animal life.
Wetlands don't do anything for the river, they just take up space where we want to build houses.
Wetlands help control flooding by storing the runoff and releasing it slowly.
Wetlands help remove pollution from stormwater before it goes into a river, lake, bay or ocean.
Wetlands are bad for the ecosystem because they breed mosquitos.

Student Writing

The writing component is one of the most valuable aspects of the program, yet it continues to be our biggest challenge. We are continually striving to improve participation in this area because it helps teachers integrate writing in the content areas and reinforces student understanding of key water resources concepts. Teachers continued to face major challenges this year in getting efficient internet access in the classroom and/or access to computer labs, which are tied up for much of the year for NM teachers with the PARCC and other computer based tests.

Many teachers joined the program this year planning to use RiverXchange as a major component of their writing program to meet Common Core Language Arts standards, which require teachers to focus more on writing within content areas. Each year, we strongly encourage teachers to have students write and edit paragraphs before going to the computer lab because this promotes higher quality thinking and writing. When students do go through this process, it shows. We also encouraged teachers to use various forms of communication in addition to writing, such as videos, PowerPoint presentations, or audio files.

We had a couple of partner classes from different regions of NM. This encouraged a greater understanding of different sections of the Rio Grande for students.Many partner teachers register for the program having already prioritized the need to organize classroom time to blog throughout the school year, so as to ensure they have a successful experience as participants. In contrast, many NM teachers register for the program to receive the beneficial learning experiences of the presentations and field trip; the blogging and partnership aspect is not as strong of an incentive for their participation as it is the main incentive for the partner teachers.

We know from discussions with teachers over the years that the absence of student writing does not mean they did not do the activities, or that no learning took place. Many teachers were dealing with issues unrelated to the program, such as new curriculum in other areas, school reorganization, construction which prevented access to the computer lab for a portion of the year, or personal life changes that conflicted with engaging more with the program. We did our best to foster successful online partnerships. Even though some blogs had minimal to no activity, NM students still benefited from the guest speakers and the field trip.

Appendix 1 includes the RiverXchange curriculum, Appendix 2 includes post presentation questions and follow up activities, Appendix 3 includes photos.

Appendix 1

Curriculum

Welcome to RiverXchange... exploring watersheds through global collaboration!

RiverXchange is about communication and developing 21st Century Skills while learning about our watersheds! Each class will be partnered with one or more classes in a different state. **The big idea is to communicate with your partners *at least twice each semester* by posting projects on your shared private educational blog and responding to what your partners have posted.**

The Big Water Questions

Understanding a Watershed

- What is a watershed?
- Where does your community's stormwater go?
- How can surface water become polluted?
- How does the water cycle relate to weather?
- What role do forests play in a watershed?
- What role do wetlands play in a watershed?
- What actions can all of us take to keep water clean?

Water in Our Society

- In what ways does our society use water?
- From what source does your community get its drinking water?
- Does everyone have the right to use as much water as they want?
- What actions can all of us take to conserve water?
- How are groundwater and surface water connected?
- How can groundwater become polluted?
- Where does your community's wastewater go?
- What is the difference between wastewater, stormwater, and drinking water?

River Ecosystem

- How does water affect living things in an ecosystem?
- What are some of the ways scientists can determine the health of a river, lake, bay or ocean?
- What are some of the ways humans have changed rivers or other aquatic ecosystems?
- What actions can all of us take to improve the health of our ecosystem?

Student Assignments:

All of the lessons in our curriculum include a “Student Assignment” which can be expressed through writing, photos, video, audio, powerpoint, or other projects. **The only requirement is that you post two projects each semester, and respond to what your partners have posted.** This new format supports the essence of our program - meaningful sharing between classes.

Suggestions include:

- Create a public service announcement
- Create a news cast with various reporters discussing different areas
- Create a short documentary
- Write a environmental journalistic piece based on water challenges in your community
- Create an animation (using a tool such as kid pix)
- Create a powerpoint presentation
- Write a poem
- Write a book report for one of the suggested books
- Create a poster and post a photo of it on the wiki

We know that with all the other pressures in schools today, it may be difficult to find time to share on the wiki. Here are some suggestions we have gathered over many years of working with teachers on this great program.

Strategies for making the most of limited computer time:

1. **Take videos on your smartphone, then post them yourself to group pages**
2. **Take pictures of posters or hand written assignments, then post to group pages.**
3. **Do a whole class project/posting using the Promethean or Smart Board.** For instance, write down all the things that can pollute our river, group them by source/non-source, identify which ones the kids can help prevent, save and post the final diagram in each of the groups on the wiki.
4. **Read postings from partners using Promethean or Smart Board, as a “Friday fun day” activity** on the weeks they have posted. This could be done as a reading aloud/public speaking exercise.
5. **Identify and train one student from each group to be the “tech leader.”** Have just these students use the limited classroom computers to post the group projects.
6. **Encourage posting from home as homework.** Just be sure to monitor what was posted the next day. Even if not all students have computers at home, some will. Consider dividing students up so that at least one person in each group has computer access at home, and they could become the “tech leader.”

Strategies for planning and integrating with other curriculum:

1. When looking at your plans for the year, for all subjects, keep RiverXchange in mind. Remember, if you want to post “out of order” that is fine!
2. Modify the style of writing to match what you are planning to cover at that point in the year.
3. Posting shortly after a guest speaker comes to your class is recommended, so you could also consider rearranging your language arts curriculum (and scheduling your computer lab time) to coordinate with times when presenters are scheduled.
4. Whatever subject you enjoy the most, see how you can use RiverXchange to enhance it.
    a. Social studies: history of why early settlers lived where they did, economic impact of rivers and water, use of water by industries
    b. Math: calculate water use, waste, length of rivers, etc
    c. Science: volume, density, states of matter
    d. Language arts: writing is obvious but also poetry, reading informational texts, public

speaking

e. Other specialized topics such as engineering, careers, art, music

New Mexico Curriculum Overview

Remember, partners in other states may be doing their own curriculum, but we hope you will be able to have good discussion on several of these topics over the course of the year. You may also want to combine some of the lessons so that students do a project that incorporates elements of multiple topics from the curriculum. For example, you could have students write about their river's geography while also talking about its watershed and ways to keep pollution out of it.

Unit 1: Understanding a Watershed

1. River Geography
2. Watershed Model
3. Infiltration and Runoff
4. Forests and Wetlands

Unit 2: Water in Our Society

5. Commercial Uses of Our Rivers
6. Drinking Water
7. Groundwater
8. Wastewater

Unit 3: River Ecosystems

9. Field Trip (with pre and post activities)

Unit 1: Understanding a Watershed

Project 1: River Geography

Student Assignment

Write a friendly letter to your partners or create another type of project, explaining:
a) what a watershed is
b) the name of your river - this is also the name of your watershed!
c) the journey of your river from its headwaters to the ocean
d) what the river is like in your area - big/small, clear/muddy, fast/slow?
e) how much precipitation your area receives each year, and what season gets the most precipitation

Informational Texts

- *Follow the Water from Brook to Ocean*, by Arthur Dorros or *Paddle-to-the-Sea*, by Holling C. Holling
- *KRQE* news. "Moisture Makes One-Third of New Mexico Drought-Free" http://krqe.com/2015/05/26/moisture-makes-one-third-of-new-mexico-drought-free/

Classroom Activity – Flexible! Just do as much as you want, and feel free to substitute other activities.

1. Read the book, *Follow the Water from Brook to Ocean,* by Arthur Dorros (about the Colorado River) OR *Paddle-to-the-Sea*, by Holling C. Holling (most U.S. School or public libraries have one or the other, or they can be purchased online). Explain how water flows from smaller bodies of water into a larger body.
2. Show the *All About Watersheds* poster (see link below.) Introduce the concept of a **watershed** as the land area that drains into a body of water, and explain that this is where **surface water** comes from.
3. Show students the *U.S. Watersheds Map* (see link below), pointing out your watershed and your partners' watershed. Talk about the significance of the *Continental Divide* (see link below) in North America, and show them where it is in New Mexico. Ask students "Is every place in the world part of a watershed?" Even if there are no hills or mountains, and there is no visible surface water, every place IS in a watershed because precipitation that falls on that land area eventually drains somewhere.
4. Have students identify your river or stream on a large classroom map, and show them where your school is located in relation to your river (north, south, east, west). Figure out where your river or stream starts **(headwaters)**, what **tributaries** flow into it, and what ocean it flows into at its **delta** (many students may not know that the Gulf of Mexico is part of the Atlantic Ocean).
5. Point out what towns (if any) are upstream from you and discuss how they could affect your water (quantity and quality) either positively or negatively. Discuss what towns are downstream (if any) and how your town could affect their water, either positively or negatively. Trace your river's path to the ocean, recording each body of water it passes through.
6. Locate your school and your partners' school on the *Precipitation Map* (see link below). How many inches of precipitation does your area receive? Compare with your partner's ecosystem. You may want to read the Albuquerque Journal article (see link above) about the drought in New Mexico.
7. Discuss seasons, timing of your area's precipitation, the altitude of your area and how these affect weather. Explain how **precipitation** and **snowpack** affect the river.
8. Show students the *Major Cities and Rivers Map* (see link below), and ask them why they think so many big cities are located near major bodies of water.
9. ***Optional:*** If you have time, students (or groups of students) could research major flora and fauna in different regions along the length of your river or tributaries and create a picture postcard from that place. Or, they could write a story about a journey down the river.
10. ***Optional:*** New Mexico classes -- for more information about the Rio Grande watershed in New Mexico, show students the *Everything is Connected in a Watershed* poster (in teacher packet), then visit the *All About Watersheds* website (see link below) to explore the interactive version.

11. ***Optional:*** Learn about the Great Pacific Garbage Patch and ocean gyres, using the PBS lesson plan and video (see link below). You may also want to show photos taken by Chris Jordan on Midway Atoll demonstrating the effects of wildlife consuming plastic.

Materials

- *U.S. Watersheds* map: http://maps.howstuffworks.com/united-states-watersheds-map.htm
- *Basic information about the Continental Divide:* http://education.nationalgeographic.com/encyclopedia/continental-divide/
- *Precipitation Map:* http://www.wrcc.dri.edu/pcpn/us_precip.gif
- *Major Cities and Rivers Map:* http://cgee.hamline.edu/rivers/Resources/watershedmaps/quiz3.htm
- *Everything is Connected in a Watershed* poster and *All About Watersheds* website link: http://allaboutwatersheds.org/poster/poster_view
- ***Optional:*** Great Pacific Garbage Patch lesson plan http://www.pbs.org/kqed/oceanadventures/video/gyre and Laysan Albatross photos http://ocean.si.edu/slideshow/laysan-albatrosses%E2%80%99-plastic-problem **(Caution - these photos are pretty graphic, so be sure to preview before sharing with students.)**

Vocabulary

- **Watershed:** The land area from which snowmelt and rain drain into a river, lake or other body of water. Also known as a drainage basin or catchment.
- **Surface water:** Water collected on the ground or in a waterbody such as a stream, river, lake, wetland or ocean.
- **Continental Divide:** A drainage divide on a continent (in the U.S., the Rocky Mountains) such that the drainage basin on one side of the divide feeds into one ocean or sea, and the basin on the other side either feeds into a different ocean or sea.
- **Headwaters:** The source of a river (where it starts).
- **Tributary:** A creek, stream, or river which feeds a larger stream or river or a lake.
- **Delta:** The mouth of a river (so named because it is triangle-shaped like the Greek capital letter Delta).
- **Desert:** A region that receives less than 10" of precipitation per year.
- **Precipitation:** All the water that falls from the sky, in solid or liquid form, such as rain, snow or hail.
- **Snowpack:** The amount of snow that accumulates annually in a mountainous area.
- **Floodplain:** Land that may be submerged by flood waters, or a plain built up by materials deposited by a river.

Project 2: Watershed Model

For NM classes, this is presented by a guest speaker. For partner classes, we encourage you to see if you can find someone from a local agency who has a watershed model, such as the Enviroscape.

Student Assignment

Write a *persuasive* paragraph, or create another type of project, about why it is important to keep stormwater clean and what we should do.

Informational Texts

- *Science News for Kids* article. "Suffocating Waters" http://www.d123.org/olhms/dedie/documents/suffocatingwaters.pdf
- *CNN* article. "Garbage Man of the River" http://www.cnn.com/2013/04/18/us/cnnheroes-pregracke-rivers-garbage

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Watch *The Human Solution to Water Pollution* video (see link below).
2. Schedule a guest speaker to bring a model of a **watershed**, OR make your own using the activity on the back of the USGS poster – *Watersheds: Where We Live* (the poster can be shown on a smartboard – see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page).
3. Discuss how the gutters in our streets lead to **storm drains**, which often lead directly to the nearest body of water. Discuss the difference between **stormwater** and **wastewater** (from household drains and toilets). Find out how your community handles stormwater – is it combined with a municipal wastewater (sewage) system?
4. Read news articles (see links above) about garbage in rivers and dead zones caused by nutrients in agricultural runoff. Review the *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet), and brainstorm other ways to reduce **nonpoint-source pollution**.
5. ***Optional:*** For a great math-based extension activity, try *Don't Trash Our Rio* (in teacher packet) where students learn how much trash is pulled from Albuquerque's storm drain system yearly, and calculate how many trash bags or classrooms it would fill. Even though it is based on an Albuquerque news article, this activity is applicable to any area that has a storm drain system.
6. ***Optional:*** Watch *The Majestic Plastic Bag* video (see link below).
7. ***Optional: New Mexico classes,*** watch *Segment 3* of the Mid Rio Grande Stormwater Quality Team's educational video (link below) to learn about Albuquerque's and Rio Rancho's stormwater system.
8. ***Optional: Partner classes,*** Google "stormwater" in your area and see what information is there. Water districts, the Departments of Health and Environment etc. have many educational resources.

Materials

- *The Human Solution to Water Pollution* video (to right of screen): http://sscafca.org/teacher-resources/
- *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet and on wiki Curriculum page)
- Watershed model such as Enviroscape, **OR** USGS poster – *Watersheds: Where We Live* (the poster is available at http://water.usgs.gov/outreach/Posters/watersheds/grade.html and a printable copy of the activity is on the RiverXchange Curriculum Page) and supplies:
  - Butcher paper (or newspaper) and plastic wrap
  - Several large baking pans or plastic containers (clear ones can be reused for Project 4: Groundwater)
  - Waterproof marker
  - Spray bottles filled with water
  - Small plastic houses, cows and cars (or little pieces of modeling clay to represent these)
  - Cocoa powder and colored drink powders
- ***Optional:*** *Don't Trash Our Rio* activity (in teacher packet)
- ***Optional:*** *The Majestic Plastic Bag* video: https://vimeo.com/14221747

- ***Optional:*** Watch *Segment 3* (16:05-end) of the Mid Rio Grande Stormwater Quality Team's educational video: http://www.keeptheriogrand.org/keeping-the-rio-grand/

Vocabulary

- **Watershed:** The land area from which snowmelt and rain drain into a river, lake or other body of water. Also known as a drainage basin or catchment.
- **Point-source pollution:** Water pollution coming from a single point, such as a sewage-outflow pipe or a factory.
- **Nonpoint-source pollution:** Water pollution coming from a wide land area, not from one specific location. Occurs when rainwater, snowmelt, or irrigation runs off plowed fields, city streets, or suburban backyards, picking up soil particles and pollutants, such as nutrients, pesticides, and other chemicals.
- **Storm drain:** A drain, often under sidewalks, designed to collect excess rain and ground water from impermeable surfaces such as streets, parking lots, sidewalks, and roofs. Also known as a storm sewer.
- **First flush:** The first surface runoff of a rainstorm. This is when we see the highest levels of pollution in water entering the storm drains.
- **Stormwater:** Runoff from a storm which either flows directly into a water body or is channeled into storm drains, which eventually discharge to surface waters.
- **Wastewater:** All the water that goes down a drain into a municipal sewer system or septic system. Also known as sewage.

Project 3: Infiltration and Runoff

Student Assignment

Where does rainwater go when it falls on your school grounds? Write a *RACE* paragraph, or create another type of project, using evidence from your mini-field trip around the school.

Informational Texts

- *USA Today* article. "La Niña Brings Flood Risks, Drought to the West" http://usatoday30.usatoday.com/weather/news/2011-05-12-west-floods-drought_n.htm
- *LA Times* article. "3 days after rain, beach water can still make swimmers ill, study says" http://www.latimes.com/science/sciencenow/la-sci-sn-beach-advisories-storm-runoff-20140303-story.html#axzz2v99eazt7.

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Listen to the *Water Cycle Song* (see link below). You may want to print out the lyrics for students (a printable copy is on the RiverXchange Curriculum Page). Review the six major components of the water cycle: **precipitation, runoff, infiltration, evaporation, transpiration,** and **condensation.**
2. Discuss how the sun's energy starts the whole process, and how the water cycle relates to weather, recalling the amount and timing of your area's precipitation.
3. Point out that when precipitation hits the ground, it can either run off, sink in (infiltration, also known as percolation) or evaporate back into the air. Explain how all plants move water from the ground to the air through the process of transpiration.
4. Read the *USA Today* article (see link above) and discuss how **La Niña** and **El Niño** bring dry weather or wet weather to your area. Discuss what happens in different areas of the school when you have too much rain – are there areas that flood?
5. Using *Investigating the School Grounds* (a printable copy is on the RiverXchange Curriculum Page) as a guide, take students on a "mini field trip" to investigate where rainwater goes on your school grounds to observe changes in land contours, and the location of downspouts and catchment areas. Discuss where runoff appears to be occurring, what affects infiltration, and the difference between **permeable** and **impermeable surfaces**.
6. Discuss how storm drains carry pollution from impermeable surfaces into the nearest body of water, whereas the process of infiltration into permeable surfaces helps filter out pollution. You may want to read the LA Times article (see link above) about pollution from stormwater.
7. Discuss how runoff can cause flash floods. In Albuquerque, concrete-lined arroyos are very dangerous because runoff comes from a larger area and the water moves very fast – people have drowned. In Rio Rancho, the arroyos in their natural state are generally safe unless rain clouds are visible.
8. ***Optional:*** For a math-based extension, test infiltration on various surfaces, using *Does it Soak Right In?* (a printable copy is on the RiverXchange Curriculum Page) as a guide. Graph the data as a class to build data analysis skills.

Materials

- *Investigating the School Grounds* activity (a printable copy is on the RiverXchange Curriculum Page)
- *Water Cycle Song:* http://www.abcwua.org/education/music/water%20cycle%20song.mp3
- *Water Cycle Song* lyrics (a printable copy is on the RiverXchange Curriculum Page)
- ***Optional:*** *Does It Soak Right In?* activity (a printable copy is on the RiverXchange Curriculum Page)
    - A soup can for each group, all the same size, with both ends cut off
    - Stopwatches
    - Rulers
    - Measuring cups

Vocabulary

- **Precipitation:** All the water that falls from the sky, in solid or liquid form, such as rain, snow or hail.
- **Runoff:** The rain or snow that does NOT sink into the ground, that runs off the land into a river, lake or other body of water (often carrying dirt and pollution with it).
- **Infiltration:** The process of water sinking down into the ground to refill the aquifer. Also called percolation.
- **Evaporation:** The process by which water changes from liquid to vapor (water in a puddle, river, lake, ocean, or other body of water evaporates into the air).
- **Transpiration:** The process by which water comes out of the leaves of plants, primarily through openings in the leaves, and goes into the air.
- **Condensation:** The process by which water changes from vapor to liquid (water in clouds condenses to form rain).
- **Impermeable surface:** A material that water can NOT soak into (or infiltrate); also called an impervious surface.
- **Permeable surface:** A material that water can soak (or infiltrate) into; also called a pervious surface.
- **Flash flood:** A rapid flooding (less than six hours) of low-lying areas (such as washes, rivers, dry lakes, basins), caused by heavy rain, snow or sudden ice melt in surrounding areas.
- **Arroyo:** A Spanish word for a drainage ditch, gully or ravine which was carved by water drainage.

Project 4: Forests and Wetlands

Student Assignment

Write a *persuasive* paragraph, or create another type of project, about why wetlands and forests are important in our watersheds.

Informational Texts

- *ABQ Journal* article. "River Diversions Halted Due to Burn Scar Runoff" http://www.abqjournal.com/45855/abqnewsseeker/river-diversions-halted-due-to-burn-scar-runoff.html
- American Forests. "Forests and Water" https://www.americanforests.org/conservation-programs/forests-and-water/
- *Rapid City Journal* article. "Federal Government Confirms Wetland Channels Are Keeping Rap id Creek Cleaner" http://rapidcityjournal.com/news/local/federal-government-confirms-wetland-channels-are-keeping-rapid-creek-cleaner/article_b2a2e469-5100-5a66-866d-0733f183b0ee.html

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Watch *The Adventures of Junior Raindrop* video (see link below) to learn about how vegetation helps prevent **erosion**.
2. Read the *ABQ Journal* article (see link above) about erosion from wildfires polluting the Rio Grande.
3. Do the *Wetland Model* activity from the back of the USGS poster – *Wetlands: Water, Wildlife, Plants* (the poster can be shown on a smartboard – see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page) to examine the effects of a **wetland** in reducing erosion and controlling flooding.
    - To model forests in the watershed, stick cotton balls in the clay and repeat the experiment again to see that the muddy water gets even cleaner as it travels through the "forest."
4. Even in desert areas like New Mexico, there are wetlands, and **riparian areas**. Many are constructed (man-made) specifically for cleaning stormwater. Read the *Rapid City Journal* article (see link above) on how constructed wetlands help keep their creek clean. Discuss how these areas also support a diverse community of living things, and how many people used to think wetlands were not important. In fact, they would fill them in with soil and build right on top of them!
5. Find books from your library on different kinds of wetlands, and discuss the differences in wildlife and plant communities they support – *OR* watch the *NatureWorks* video (see link below).
6. ***Optional:*** Do the *Water Treatment Plants* activity (see link below) to see how celery sticks, like wetland plants, can help filter water by absorbing pollution. This activity is very quick to set up, then just wait one day to see what happens.
7. ***Optional: New Mexico classes,*** watch the section about Sanchez Farm in the Mid Rio Grande Stormwater Quality Team's educational video (link below) to learn how a constructed wetland helps clean stormwater.

Materials

- *The Adventures of Junior Raindrop* video: http://www.archive.org/details/Adventur1948
- USGS poster – *Wetlands: Water, Wildlife, Plants.* The poster is available at http://water.usgs.gov/outreach/Posters/wetlands/middle.html, and a printable copy of the activity is on the RiverXchange Curriculum Page.
- Supplies:
    - Small rectangular plastic storage containers, or baking pans or paint trays
    - Modeling clay
    - Small pieces of carpet
    - Cotton balls

- *NatureWorks* video http://video.nhptv.org/video/1491178229
- ***Optional:*** *Water Treatment Plants* activity (a printable copy is on the RiverXchange Curriculum Page)
    - Celery sticks
    - Cups of colored water
- ***Optional:*** *Keeping the Rio Grand* http://www.keeptheriogrand.org/keeping-the-rio-grand/, the Mid Rio Grande Stormwater Quality Team's educational video (the part about the constructed wetland is from 13:12 - 16:01)

Vocabulary

- **Erosion:** The process in which a material (such as a river bank) is worn away by water or air, often due to the presence of abrasive particles in the stream.
- **Wetland:** An area such as a marsh or swamp that is covered with shallow water or where the soil is naturally soaked with water.
- **Riparian area:** The area around the banks of a natural body of fresh water, where the vegetation and landscape is directly influenced by that water.

Unit 2: Water in Our Society

Project 5: Commercial Uses of Our Waterways

For NM classes, this is presented by a guest speaker from the county's Cooperative Extension. For partner classes, we encourage you to see if you can find someone from a local agency or business who can present on this topic.

Student Assignments

Write an *informational* paragraph or a *friendly letter* to your partners, or create another type of project, explaining:

a) How was the river (or other waterway) important when people first settled in your community?
b) How has your waterway been used by people for commerce (to make money) in your community's history?
c) Do some people still rely on the waterway for their jobs, such as farming, fishing, shipping, or recreation?
d) What technologies have people developed to solve water problems in your area (like drilling wells, building dams, locks, and fish ladders, different kinds of irrigation, or technologies to conserve water or prevent pollution?)

Informational Texts

- *ABQ Journal* article. "Deal Allows Farmers to Sell Irrigation Water" http://www.abqjournal.com/221194/news/deal-allows-farmers-to-sell-irrigation-water.html
- *National Geographic* article. "Parched: A New Dust Bowl Forms in the Heartland" http://news.nationalgeographic.com/news/2014/05/140516-dust-bowl-drought-oklahoma-panhandle-food/

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Research the major commercial use(s) of your river/waterway (such as agricultural **irrigation**, shipping/transportation, electricity, fisheries and/or recreation) and invite a guest speaker to present, or find an activity that relates. In New Mexico, the only major commercial use of the Rio Grande is agriculture – 80% of the water goes to irrigation!
2. Discuss how these commercial uses influenced the location/history of your community, and how these users can also help a community conserve water and keep water clean (such as conserving water when irrigating, controlling **erosion**, keeping boat engines in good repair).
3. Discuss how people have developed technological solutions to solve water problems. For example, many ancient settlements in the West were abandoned because of lack of water, but irrigation technology has made it easier to survive. Dams have made it easier to control the flow of rivers, reservoirs store water, and fish ladders are built so that dams don't prevent their migration. High-efficiency toilets and other appliances help conserve water.
4. In NM, discuss the **acequia** system which was put in place by the Pueblo people and early Spanish settlers. Watch one of the YouTube videos if possible (see links below) or read the *Albuquerque Journal* article about water rights (see link above).
5. Show students the USGS poster - *Navigation: Traveling the Water Highways* (the poster can be shown on a smartboard - see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page). Discuss how some communities use their river for transportation, while New Mexico rivers are used mainly for agricultural irrigation. New Mexico students may not be familiar with **dams, locks** and boats traveling on the river. If your river is used for transportation, you may want to do the *River Profile* activity on the back of the poster.
6. ***Optional: Water Ripples games*** (see link below). Review ways our society uses water, particularly in agriculture.
7. ***Optional: Water Rights.*** Using the *Pass the Jug* activity guide (see link below), act out the two different methods of assigning water rights to all the water users. Discuss the difference between the Riparian Rights and Prior Appropriation doctrines. Research the history of water rights in your community and compare the

differences in water rights issues with your partners' area. Prior Appropriation is used in the western states, which receive far less precipitation. Revisit the *Precipitation Map* and discuss why this makes a difference. Read about farmers being allowed to sell their water rights to allow more water for the ecosystem.

Materials

- USGS poster - *Navigation: Traveling the Water Highways.* The poster is available at http://water.usgs.gov/outreach/Posters/navigation/grade.html, and a printable copy of the activity is on the RiverXchange Curriculum Page.
- ***Optional: Water Ripples games.*** http://aces.nmsu.edu/ces/watertaskforce/water%20ripples%20gameshow%20quiz/index.html
- ***Optional: Water Rights***
    - Prior Appropriation Game http://www.troutintheclassroom.org/sites/www.troutintheclassroom.org/files/documents/PriorAppropriationGame.doc
    - *Precipitation Map*: http://www.wrcc.dri.edu/pcpn/us_precip.gif
    - *Ancient Irrigation* video: http://www.youtube.com/watch?v=RUv2Tz1ayTc
    - *Ditch Cleaning at Arroyo Hondo* video: http://www.youtube.com/watch?v=YyqxdbsEObU

Vocabulary

- **Irrigation:** Watering crops. When natural precipitation is not enough for crops, farmers use flood irrigation (common in New Mexico), drip irrigation and/or overhead sprinklers.
- **Acequia:** An irrigation ditch used to distribute water from rivers to farms. Most are simple ditches with dirt banks, but they can be lined with concrete. An important form of irrigation in the development of agriculture in the American Southwest.
- **Erosion:** The process in which a material (such as a river bank) is worn away by water or air, often due to the presence of abrasive particles in the stream.
- **Dam:** A barrier built across a river to hold water back; sometimes used to generate electricity.
- **Lock:** A chamber with gates that close off for raising and lowering boats on a river or canal.

Project 6: Drinking Water

For NM classes, this is presented by a guest speaker from the water utility. For partner classes, we encourage you to see if your local utility can send someone to present.

Student Assignments

Write a *persuasive* paragraph (or create another type of project) explaining why it is important to conserve water, and what we should do.

Informational Texts

- Santa Fe drinking water article (a printable copy is on the RiverXchange Curriculum Page)
- Albuquerque drinking water article (a printable copy is on the RiverXchange Curriculum Page)
- *LA Times* article. "Americans use twice as much water as they think they do, study says" http://www.latimes.com/science/sciencenow/la-americans-underestimate-personal-water-usage-study-says-20140227-story.html#axzz2v99eazt7
- *A Long Walk to Water*, by Linda Sue Park (2010: Clarion Books, 128 pages)
- "How Does Water Use in the United States Compare to That in Africa?" https://www.awf.org/blog/how-does-water-use-united-states-compare-africa

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Discuss the *Indoor Water Use* graph (see link below), emphasizing that all of these activities use clean **drinking water.** Explain that in homes and other buildings there is one set of pipes that bring clean drinking water into the home and a different set of pipes that takes the dirty water away. Be sure to mention that in many parts of the country (like in NM) people use almost as much for watering plants outdoors as all their indoor water use combined. Discuss how **xeriscape** and watering during the coolest part of the day can help.
2. Schedule a guest speaker to present on where your drinking water comes from, how it is treated to make it safe for drinking, and/or ways to conserve water. **OR** research where your drinking water comes from, and do *The Value of Water* activity from the back of the USGS poster - *Water: The Resource That Gets Used & Used & Used For Everything* (the poster can be shown on a smartboard - see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page). Students will examine their water use by using play money to record their daily usage, then brainstorm how to **conserve**. For a math-based extension activity, you can graph the data as a class to build data analysis skills.
3. Discuss how flooding or drought can affect your community's drinking water. Look for articles in your local paper, or read one of the suggested articles (see links above).
4. ***Optional: Water Footprint.*** Calculate your impact using an online tool (see link below).
5. ***Optional: Water Use in Other Countries.*** To learn more about water use in other countries, read the article about water use in Africa (see link above), invite a guest speaker from Water for People (see link below) and/or watch the *Water for Life* video, and/or read the book *A Long Walk to Water*, by Linda Sue Park. Compare average indoor water use in the U.S. to that in other nations.
6. ***Optional: The Water-Energy Connection.*** Show students the *Power Couple* video and/or water-energy posters to learn about the connection between electricity and water use, then do the activity (see links below.).

Materials

- *Indoor Water Use Graph* http://www.epa.gov/WaterSense/pubs/indoor.html
- USGS Poster – *Water: The Resource That Gets Used & Used & Used For Everything.* The poster is available at http://water.usgs.gov/outreach/Posters/water_use/grade.html, printable copy of the activity is on the RiverXchange Curriculum Page.
- ***Optional: Water Footprint Calculator***
  - http://environment.nationalgeographic.com/environment/freshwater/change-the-course/water-footprint-calculator/

- ***Optional: Water Use in Other Countries***
  - Find a guest speaker from your local Water for People Committee: http://www.waterforpeople.org/take-action/volunteer
  - OR *Water for Life* video: http://www.archive.org/details/Unworks-MTV-WFL
- ***Optional: The Water-Energy Connection***
  - *Power Couple: The Shocking True Story of Water and Electricity* video, with viewers' guide and posters. http://www.abcwua.org/education/Energy_Water_Nexus.html
  - *Understanding the Energy Demand of Bottled Water.* http://www.earthday.org/sites/default/files/3.%20Understanding%20the%20Energy%20Demand%20of%20Bottled%20Water_5-8%20Lesson%20Plan.pdf

Vocabulary
- **Drinking water:** Water that has been purified to standards set for human consumption.
- **Xeriscape:** The use of low water use plants in landscape (*not* "zeroscape".) *Xeros* is Greek for "dry."
- **Conserve:** To use something wisely; not wasting.
- **La Niña:** An irregularly occurring movement of deep cold water to the ocean surface along the western coast of South America that brings less precipitation to the southern U.S. and more to the northern U.S.
- **El Niño:** An irregularly occurring flow of unusually warm surface water along the western coast of South America that brings more precipitation to the southern U.S. and less to the northern U.S.

Project 7: Groundwater

Student Assignment

How are groundwater and surface water connected? Write a *RACE* paragraph, or create another type of project, using what you learned from the aquifer model.

Informational Texts

- *ABQ Journal* article. "State: Kirtland Jet Fuel Leak Massive" http://www.abqjournal.com/upfront/042254588838upfront05-04-10.htm
- *ABQ Journal* article. "KAFB Ramps Up Fuel Spill Cleanup" http://www.abqjournal.com/161358/news/kafb-ramps-up-fuel-spill-cleanup.html
- *LA Times* article. "Groundwater contamination a growing problem in L.A. County wells" *http://www.latimes.com/visuals/graphics/la-me-g-drought-wells-20150520-htmlstory.html*

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Watch *The Story of Groundwater* video (see link below) to learn the difference between **groundwater** and **surface water.**
2. Show students the *Major U.S. Aquifers* map (see link below) and locate your **aquifer**.
3. Do the activity *Recharge-Discharge* from the back of the USGS poster – *Groundwater: The Hidden Resource* (the poster can be shown on a smartboard – see link below, and a printable copy of the activity is on the RiverXchange Curriculum Page). Students build a simple aquifer model to learn about the **water table**, how a **well** works, and how groundwater and surface water are connected. Discuss how if we pump too much of surface water it can deplete groundwater, and vice versa. Also, if one person pumps too much groundwater from their well, it can affect their neighbors' wells.
4. Leaking underground tanks (such as septic tanks or gas tanks beneath gas stations) are a major source of groundwater pollution. This can be demonstrated using small plastic cups with holes poked in the bottom. Sink a cup into the gravel of the model and fill it with colored water to see how pollution spreads through groundwater. Note that contaminated groundwater can pollute surface water and vice versa.
5. Read articles from the Albuquerque Journal about a jet fuel leak from Kirtland Air Force Base (see links above) or find articles about similar issues in your area. Discuss what types of pollution can get into groundwater and what can't. Solids such as trash and dog poop on the earth's surface cannot travel down to the aquifer. Dissolved chemicals, heavy metals, and very large amounts of farm animal waste can, however.
6. Read the resources about groundwater from the Groundwater Foundation (see links below). Review the *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet). Brainstorm other ways to prevent groundwater pollution.

Materials

- *The Story of Groundwater* video. https://archive.org/details/Groundwater_Animation
- *Major U.S. Aquifers* map: http://pubs.usgs.gov/ha/ha730/ch_a/gif/A004_us.gif
- *Top Ten Ways to Protect Our Precious Water* handout (in teacher packet)
- USGS poster – *Groundwater: The Hidden Resource.* The poster is available at http://water.usgs.gov/outreach/Posters/groundwater/grade.html and a printable copy of the activity is on the RiverXchange Curriculum Page.
- Supplies:
    - Several clear baking pans or plastic containers
    - Gravel to fill containers 2/3 full
    - Several pump tops from soft-soap or hand-lotion containers
    - Paper cups with holes punched in the bottom to sprinkle water
    - Colored drink powder

- *The Groundwater Foundation* - Uses of groundwater including chart http://www.groundwater.org/get-informed/basics/groundwater.html
- *The Groundwater Foundation* - Contamination http://www.groundwater.org/get-informed/groundwater/contamination.html

Vocabulary

- **Aquifer:** A wet underground layer of water-bearing rock or materials (gravel, sand, silt or clay) from which groundwater can be extracted using a well.
- **Groundwater:** Water located beneath the earth's surface in cracks between soil particles and fractures in rock formations. A large and usable quantity of groundwater is called an aquifer.
- **Surface water:** Water collected on the ground or in a waterbody such as a stream, river, lake, wetland or ocean.
- **Water table:** The top surface of an aquifer (how far you have to dig down to find water).
- **Well:** A man-made hole with a pipe that goes down to the water table. A pump helps bring the groundwater up.

Project 8: Wastewater

For NM classes, this is presented by a guest speaker from the water utility. For partner classes, we encourage you to see if your local utility can send someone to present.

Student Assignment

Write a *narrative* or *creative* paragraph, or create another type of project, explaining the journey of your community's wastewater.

Informational Texts

- *KOAT* news. "Aging Pipes Mean Higher Water Bills" http://www.koat.com/news/aging-pipes-could-mean-water-bill-hike/34284754
- Combined sewer overflows article, by Anne Jefferson, a geology professor from Kent State. http://all-geo.org/highlyallochthonous/2013/03/combined-sewer-overflows-solving-a-19th-century-problem-in-the-21st-century/

Classroom Activity – **Flexible! Just do as much as you want, and feel free to substitute other activities.**

1. Invite a guest speaker to learn about where your community's **wastewater** goes, *OR* if your community has a municipal sewer system, do the activity *Where Does Your Used Water Go?* on the back of the USGS poster - *How Do We Treat Our Wastewater?* (the poster can be shown on a smartboard – see link below; printable copy is on the RiverXchange Curriculum Page).
2. Read the article about Albuquerque's crumbling sewer infrastructure, and/or the article about combined sewer overflows (see links above), or find news articles about issues in your area. If possible, you may want to watch the YouTube video, *A Drop's Life*, about combined sewer overflows in the Washington, DC water system.
3. Show students the *Septic System* poster (the poster can be shown on a smartboard, and a printable copy is on the RiverXchange Curriculum Page) and explain the difference between a **sewer system** and a **septic system** – they both treat wastewater essentially the same way, but a septic tank is right by the house and uses a drainfield in rural areas. If desired, watch the *Dirty Jobs* video (see link below). If your community has mostly septic systems, discuss how important it is to have the tanks pumped out regularly to avoid groundwater pollution.
4. Discuss what kinds of things NOT to put down the drain or toilet – for example, fats, oils, and grease can solidify in pipes and cause a backup. Discuss how treated wastewater is recycled in many communities (such as watering golf courses), and how a community's treated wastewater will be used by downstream communities.
5. Review the differences between **stormwater**, **drinking water,** and **wastewater,** emphasizing how different sets of pipes are involved, and that the "quality" of the water being transported is very different.

Materials

- USGS poster - *How Do We Treat Our Wastewater?* The poster is available at http://water.usgs.gov/outreach/Posters/wastewater/grade.html, and a printable copy of the activity is on the RiverXchange Curriculum Page.
- Supplies:
  - 14 feet of yarn, string or rope
  - Shredded paper or packing peanuts and a cardboard box
- *Septic System* poster (on the RiverXchange Curriculum Page).
- Combined Sewer Overflow video: *A Drop's Life.* Applies to certain cities only, mostly in the eastern US, find out if your city has this type of system. https://www.youtube.com/watch?v=5Ug1hravb9Q
- *Dirty Jobs: Septic Tank Technician* video **(Caution – this video has one bad word at 1:16)** http://home.howstuffworks.com/home-improvement/plumbing/sewer2.htm

<u>Vocabulary</u>

- **Wastewater:** All the water that goes down a drain into a municipal sewer system or septic system. Also known as sewage.
- **Sewer system:** A system of underground pipes used to transport human waste. In some communities, the sewer system is combined with the storm system (known as a combined sewer).
- **Septic system:** A small-scale sewage treatment system common in areas with no connection to a municipal wastewater system. A septic tank is a key component of a septic system.
- **Stormwater:** Runoff from a storm which either flows directly into a water body or is channeled into storm drains, which eventually discharge to surface waters.
- **Drinking water:** Water that has been purified to standards set for human consumption.

Unit 3: River Ecosystem Field Trip

Project 9: Field Trip

Student Assignment

Write a *narrative* paragraph or a *friendly letter* to your partners, or create another type of project, about your field trip:

a) If you tested the water, explain why we collect water quality data and what it means.

b) If you planted trees or did another service learning project, explain how your project will help the river ecosystem.

Informational Texts

- *A Waterproof Case* (in teacher packet)
- *The Water Down Under* booklet (in teacher packet)
- Local ecosystem articles (These are for NM - teachers in other areas should search local newspapers for articles about their own ecosystem).
    - *ABQ Journal* article. "Battle with Beavers" http://www.abqjournal.com/45685/north/battle-with-beavers.html
    - *Santa Fe New Mexican* article. "Crews complete restoration project at Buckman recreation area" http://www.santafenewmexican.com/news/local_news/crews-complete-restoration-project-at-buckman-recreation-area/article_284dd705-05e8-59bb-8585-f00934e93516.html
    - *The Washington Times* article. "NM water release aims to help silvery minnow" http://www.washingtontimes.com/news/2014/may/6/water-release-aims-to-help-silvery-minnow/?page=all

Pre-Field Trip Activities

1. Define an **ecosystem** (the physical environment together with all the species that live there). Discuss how living things depend on the nonliving things, such as water, air, soil/rocks, and the sun.
2. Read *The Water Down Under* booklet to learn more about macroinvertebrates and water quality. Discuss the role of **aquatic macroinvertebrates** in the **food web** and what they can tell us about the health of our ecosystem. Many animals depend on them for food. Some aquatic macroinvertebrates are sensitive to pollution, so one way scientists can tell how healthy a river ecosystem is by looking at which types of macroinvertebrates are living in the water. Many spend only part of their lives in the water, so if the water is polluted, it has far-reaching effects on the ecosystem. Discuss **producers, consumers** and **decomposers**, and where aquatic macroinvertebrates fit (some are consumers, some are decomposers).
3. Talk about the field trip and location, and what students can expect.
4. ***Optional: Frogline News***. Watch a newscast by frogs (see link below) to revisit how pollution gets into surface water. Discuss the significance of frogs (i.e., the frog is a biological **indicator species** because it is very sensitive to water pollution). Remind students of the watershed model and how they can prevent nonpoint-source pollution.
5. ***Optional: Acid Rain***. Watch the video *How Acid Rain Works* (see link below).

Field Trip

1. **For New Mexico Classes:** Field trips may include a service learning project, such as tree planting or an agricultural activity. Otherwise, they will incorporate hands-on lessons about **riparian areas**, wetlands, macroinvertebrates and water quality, and students will use a field journal. On the field trip, students will gather data about pH, temperature, turbidity and dissolved oxygen.
2. **For Partner Classes:** We strongly encourage you to take any water-related field trip available in your area, and we can help if you have trouble finding one.

Post-Field Trip Activity

1. Review how land use affects water quality and what the water quality data tells us about the ecosystem.
   - Increased river temperature can be caused by many things including low river flow, large areas of impermeable surfaces, lack of vegetation, and stormwater that is warm from flowing over roads.
   - High temperature and/or fertilizers (including pet waste) can cause algae bloom, which reduces dissolved oxygen.
   - Erosion or algae bloom can cause turbidity, leading to higher temperature.
   - Acid rain, mine drainage or algae bloom can cause low pH (normally pH is determined by the types of rocks or trees present in the watershed).
2. Read news articles about issues in your local ecosystem. A few articles for NM are provided (see links above).
3. ***Optional: River Food Web.*** Make a food web for your local ecosystem, identifying producers, consumers and decomposers, **native species** and **invasive species,** as well as local **endangered species**. Discuss how wildlife are “water users” too. Like humans, wildlife needs clean water to live, so as a community we must consider their needs when making choices about water. **NM Classes:** use Bosque plant and animal cards to do *The Web* activity (a printable copy is on the RiverXchange Curriculum Page), discussing how all living things depend on each other. **For Partner Classes**: *The Web* activity can be applied to any ecosystem and is a fun way to get kids thinking “on their feet”.

Materials

Pre-Field Trip Activities:

- *Frogline News* video: http://www.dailymotion.com/video/x2qhkrw
- ***Optional: Acid Rain.*** *How Acid Rain Works* video, http://science.howstuffworks.com/nature/climate-weather/atmospheric/acid-rain.htm

Field Trip:

- *Macroinvertebrate Data Sheets* (if desired, printable copies are on the RiverXchange Curriculum Page).

Post-Field Trip Activities:

- *World Water Monitoring Challenge* website http://worldwatermonitoringchallenge.com/
- ***Optional: The Web*** food web activity (a printable copy is on the RiverXchange Curriculum Page).

Vocabulary

- **Ecosystem:** All the living and nonliving things that interact in a particular place.
- **Bosque:** A Spanish word for woodlands, it refers to the riparian areas of stream and river banks in the southwestern US.
- **pH:** A measure of the acidity or alkalinity of water (or a solution) on a scale that ranges from 0 (extremely acidic) to 14 (extremely alkaline). Pure water has a pH of 7 (neutral).
- **Turbidity:** A measure of water clarity based on the amount of particles suspended in it.
- **Dissolved oxygen:** The concentration of oxygen dissolved in water, expressed in milligrams per liter or as a percent saturation.
- **Riparian area:** The area around the banks of a natural body of fresh water, where the vegetation and landscape is directly influenced by that water.
- **Aquatic macroinvertebrates:** Animals that have no backbone, are visible with the naked eye, and spend all or part of their life in water. This diverse group includes worms, mollusks, arachnids, crustaceans, and insects.
- **Food web:** A representation of the predator-prey relationships between species within an ecosystem.
- **Producers:** Organisms, generally plants, that make their own food (using only the sun's energy, water, and inorganic compounds), and are the foundation of the food chain.
- **Consumers:** Organisms that obtain nutrients by eating other organisms (such as plants or other animals).
- **Decomposers:** Organisms (such as bacteria, fungi, other plants and animals) that break down the remains of dead organisms, releasing the substances that can be used by other members of the ecosystem.
- **Native species:** A species that naturally occurs in a particular ecosystem.

- **Invasive species:** A plant or animal introduced from a different area that competes with native species that is taking over an area.
- **Endangered species:** A plant or animal species existing in such small numbers that it is in danger of becoming extinct (dying out completely).

Appendix 2

Extension Questions and Activities

Field Trip:

Extension Activities:

- Write a *narrative* paragraph or a *friendly letter* to your partners, or create another type of project, about your field trip: Explain how your project will help the river ecosystem and what you learned. Describe what was difficult for you on the field trip and what was enjoyable.

- Make a food web for your local ecosystem, identifying producers, consumers and decomposers, native species and invasive species, as well as local endangered species . Discuss how wildlife are "water users" too. Like humans, wildlife needs clean water to live, so as a community we must consider their needs when making choices about water. Use Bosque plant and animal cards to do *The Web* activity (a printable copy is on the RiverXchange Curriculum Page), discussing how all living things depend on each other.

- Learn about The STRAW Project. An ongoing watershed restoration project first inspired by 4th graders in 1992, based in Marin Co. California! Add it to your school's library and show the documentary in class. http://www.pointblue.org/our-science-and-services/conservation-science/conservation-training/straw-program or read about the project in this article and discuss: http://www.marinij.com/article/NO/20150325/NEWS/150329872

Reflection Questions:

- What did you learn about the history of the Rio Grande River and the floodplain we planted in? How does this history impact the future of cottonwoods in the area?
- Identify some common invasive species. Where did they come from and how are they impacting the Bosque?
- What is the process of planting cottonwoods and willows and why do we do it in the wintertime?
- After this field trip, how may you see and understand the Bosque differently?
- What did you most enjoy being down in the Bosque?
- How can you apply what you learned or enjoyed on your field trip in your everyday life?

Stormwater:
Extension Activities:
For a math extension activity try the "Does it Soak Right In?" lesson
"Don't Trash Our Rio!" is another great extension activity for this presentation. That activity sheet can be found in your RX welcome folder.

You can also review the "Top Ten Ways To Protect Our Precious Water" handout in your teacher packet or within the Project 2 section on the curriculum webpage.
Here you can zoom in and explore your watershed and the watershed that family and friends live in, perhaps even your RiverXchange partners who live outside of New Mexico!:

Interactive Topographical Watershed Map of Earth

Reflection Questions:
- What is stormwater and where does your community's stormwater go?
- What did you learn about stormwater that was surprising to you?
- How does what happens in your yard or your neighbor's yard impact the watershed?
- What have you noticed about stormwater in your own neighborhood? What are things you can do to clean up stormwater?
- How can surface water become polluted?
- What's happens when rain falls on a pervious surface compared to an impervious surface? Give examples of impervious surfaces.
- How are groundwater and surface water connected?
- What are ways you can minimize stormwater pollution?
- What role do forests and wetlands play in a watershed?

Wastewater:

Extension Activities:

Through the ABQ Water Utility Authority's website you can navigate virtually through Albuquerque's wastewater system: http://www.abcwua.org/Education/SWRP_home.html or the overall water system:http://www.abcwua.org/education/el_WSD_2.html
Want to add a project-based learning component to this exercise? Use these questions and activities to go along with your tour:
http://www.abcwua.org/education/educators_WSDcur2_quest.html
Maybe even create a PSA with your class inspired by all you've learned!

Discuss what kinds of things NOT to put down the drain or toilet – for example, fats, oils, and grease can solidify in pipes and cause a backup. Discuss how treated wastewater is recycled in many communities (such as watering golf courses), and how a community's treated wastewater will be used by downstream communities.

Watch one of these videos in class to review the process of wastewater and what students can do to take care of wastewater:
-https://www.youtube.com/watch?v=Ldz29NqwK78 (An animation narrated by a young student)
-https://www.youtube.com/watch?v=tuYB8nMFxQA (A video on the water treatment process created by New Jersey American Water)

Reflection Questions:

- What is wastewater and how does it impact your community?
- What is the difference between wastewater, stormwater and drinking water?
- How can you use what you've learned to make a difference at home and at school?
- What is the process of treating wastewater in your community?
- What surprised you about the process of treating wastewater from the presentation?
- Since our wastewater gets cleaned and recycled at the wastewater treatment plant, why is it important to do what we can to keep it clean before it arrives there?

Drinking Water:

Extension Activities:

-Create a filter in class to clean contaminated water and investigate your findings with this lesson. This can be done over the course of a few days in class or you can demonstrate how a filter works with our class in a shorter lesson.: http://seplessons.ucsf.edu/node/1754

-A short article and video comparing the average consumption of water per day per person in Africa compared to in the U.S.
https://www.awf.org/blog/how-does-water-use-united-states-compare-africa

-A great lesson, learning about the issue of water scarcity and importance of conservation. Students log their personal use of and observation of water use over two days. Students can discuss their findings and talk about what would happen if water scarcity were an issue. There is also a TRUE/FALSE game to learn about water and how it impacts the human body and communities. https://thewaterproject.org/resources/WaterLogs_5to8.pdf

Reflection Questions:

- Where does your drinking water come from and what communities rely on it?
- Drinking water is used for much more than bathing, flushing toilets and drinking. What are other ways you and your community use drinking water? Did you learn anything surprising about how we use drinking water, if so - what?
- What percentage of the Earth is covered in water? Out of that amount, how much is accessible fresh water? How much is available as drinking water and why is it important to conserve it?
- One-third of the world's population does not have access to clean drinking water. How would your life be different if you had to walk miles to bring back water to your family?

Agriculture:

Extension Activities:

To explore more about the Dust Bowl with your students:
http://www.pbs.org/kenburns/dustbowl/educators/overview/

Out of the Dust- Karen Hesse (This book is in the voice of 14 year old Billie Jo. She narrates her struggle to help her family in the years of the Depression from the Dust Bowl. Takes place in Oklahoma, written as a poem. This book helped me fall in love with reading when I was in 5th grade!)

Extension activity: Interview a grandparent or an adult friend who knows about the Depression through personal experience or through stories told by their parents and relatives. Share with class members.

Soil is Not Trivial lesson plan

Reflection Questions:

- What was the Dust Bowl and how did it impact people?
- What do you think are the major agricultural lessons for us from the Dust Bowl?
- How may we be able to prevent a dust bowl from occurring?
- What is important for farmers to consider when planning how to irrigate their farm and why?
- How does agriculture relate to water and to our daily lives?
- What did you discover in your planting activity about the different types of irrigation?

Appendix 3

Photos

Exhibit 4
B.E.M.P. 2017-2018

The University of New Mexico
Department of Biology
MSC03 2020
Albuquerque, NM 87131
505.277.0758

Bosque Ecosystem Monitoring Program

BOSQUE SCHOOL
scholarship • community • integrity
BEMP Education Office
4000 Bosque School Road NW
Albuquerque, NM 87120
505.898.6388

Bosque Ecosystem Monitoring Program (BEMP)
2017-2018 Stormwater Science Education Overview

The main objective of the *Stormwater Science* outreach education program is to teach students that the health of the Rio Grande is directly correlated to the health of the surrounding watershed. BEMP educators have developed a *Stormwater Science* program that includes a 90-minute classroom activity, a four- to five-hour study trip to the Rio Grande, and an optional water chemistry lab during which students gain an understanding of the complex system. **During the 2017-2018 school-year 2247 students participated in *Stormwater Science*** activities in their classrooms, in the field or both. The classroom program was delivered to **1517 students** in **30 classrooms** at **19 different schools** in **Rio Rancho, Albuquerque, and Belen.**

The *Stormwater Science* program targets middle school and high school students using two main formats: an indoor classroom lesson and an outdoor field experience or "study trip."
The principal objective for the classroom portion of the program is to demonstrate how some of our daily (individual) actions impact the health of the Rio Grande. To reach that goal, students construct a model of the Rio Grande Watershed (see Page 6) under different scenarios. The model watershed has five different communities along the river: a cattle ranch, up-and-downstream eco-friendly towns, an urban city, and agricultural fields. Students add different „runoff cards‟ to the river downstream of the community where the runoff constituents originate. Some of the runoff is naturally occurring (e.g. turbidity) while other is human caused (e.g. pesticides or oil). The model runs through two different scenarios: (1) a *before-the-storm* and (2) an *after-the-storm*. These two versions of a watershed demonstrate the harmful effects storm water contamination can have on aquatic organisms and downstream communities.
At a broader scale, the classroom program encourages students to be reflective about their daily behaviors and to think about ways they can help keep their watershed clean. Students are asked to brainstorm ways they can help improve watershed health before educators lead a discussion on watershed stewardship that aligns with the MRGSQT educational messaging. Further, in order to reach students that identify Spanish as their first language and better capture New Mexico‟s students diversity, the handout for this activity is available to students in both English and Spanish (classroom handout is included on page 4of this document).

The main goal for the study trip is to build upon the themes of the classroom presentation and to provide a hands-on experience in water quality testing at the river. This section consists in a four to five hour trip to the Rio Grande during which students investigate how stormwater moves through the city and what it carries with it. Further, students get to collect and interpret water quality data to better understand the subject. The program starts with an arroyo survey which examines and categorizes the amount of visible pollutants (e.g. plastics, paper, dog poop, animal scat, etc.) in the San Antonio arroyo in Albuquerque, which drains to bosque. In the arroyo, students survey for several types of litter and test water quality using a LaMotte water quality monitoring kit (see Page 6). When the students arrive at the bank of the Rio Grande, they do additional water quality testing and search for macro-invertebrates. Students then collectively share their results, compare them to results they gathered in the arroyo, and discuss what the data could mean in terms of river health. This section of the curriculum allows students to have a more hands-on learning experience.

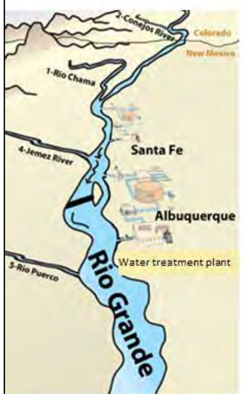
One of the challenges for middle and high school participation in programs like Stormwater Science is that teachers are only able to bring a subset of students into the field, while the rest remain at school with a substitute teacher. In order to reach more middle and high school students and provide another educational opportunity outside of the classroom, BEMP has offered a water chemistry lab during the 2016-2017 and 2017-2018 school-years. As an alternative to the conventional study trip, BEMP hoped the lab would accommodate some of the teachers‟ restrictions and provide an opportunity for hands on water testing. Very few teachers chose the lab option and generally expressed more interest in the study trip. In the future, BEMP does not plan to offer at water chemistry lab option to teachers except by special request.

During the 2017 fall semester, BEMP developed a new *Watershed Ecology* activity to use at events like our end of year Student Congress. This new activity follows the teaching objectives of *Stormwater Science*, but students collect data in a made up watershed to discover how runoff affects life in the river. Educators piloted the activity at the 2017 Rio Rancho Children‟s Water Festival and plan to use it at similar events in the future.

Hundreds of students also took part in *Stormwater Science* related field activities at three BEMP events this year. The BEMP Student Congresses (approximately 250 students and 45 teachers and chaperones), where BEMP students had the chance to share their research and experiences in the bosque, including watershed health observations; BEMP‟s Otter Day (approximately 200 students and 75 teachers and chaperones), an event for first graders, hosted by high school students to teach about endangered animals in New Mexico (see Page 7); BEMP also co-hosts the annual Sevilleta-Luquillo Virtual Symposium with Luquillo Long Term Ecological Research Site in Puerto Rico, where approximately 50 students from both sites present their research in Spanish. This year many of our Albuquerque students chose to present on the topic of watershed health. During June and July BEMP partners with Horizons Albuquerque, students learn about the many different ways in which scientists collect data about the environment, including water chemistry techniques in the Rio Grande and how their results are connected to storm events.

English Classroom Handout – Mid/High School

Hydrologist: ______________________________ Date: ______________



Stormwater Science

What 2 sources can New Mexicans get their drinking water from?

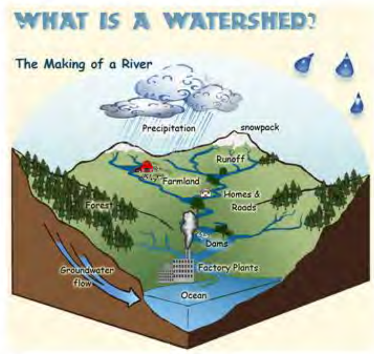
1. ________________

2. ________________

Where does water go after we use it?

____

A ***watershed*** is an area of land where all of the water that falls on it, or that is under it, drains to the lowest point.



Draw a line from the word to its definition

Turbidity	A stream or arroyo that brings water to the main channel of the river
Nonpoint source pollution	Types of nutrients found in fertilizers that can lead to excess algae growth
E.coli	A single location where pollution is being leaked into the environment
Point source pollution	A type of *bacteria* found in warm blooded animal's intestines that can make people sick
Nitrates and phosphates	Tiny 'water bugs' whose species are an indication of water quality
Tributary	*Any* type of pollution that comes from *many different* sources
Macro-invertebrates	A measure of water clarity based on the amount of suspended solids

Page 1

Cattle Ranch

Upstream eco-friendly town

Farm Fields

City

Downstream eco-friendly town

Stromwater carries runoff and pollution from every part of the watershed to the river. List some types of runoff that come from natural areas.

____

____

____

List some types of runoff that come from your community:

____

____

____

____

____

____

How do the living things in the river ecosystem react to the stormwater?

____

____

____

____

____

How can *YOU* help to keep our watershed clean?

1. ________________
2. ________________
3. ________________
4. ________________
5. ________________
6. ________________
7. ________________
8. ________________

Reduce Reuse Recycle

Page 2

Spanish Classroom Handout – Mid/High School

Hidrólogo/a: ______________________________ Fecha: ______________

Ciencia detras una tormenta

Cuales son las dos fuentes de agua de donde los Nuevo Mexicanos sacan el agua para beber?

1. ________________

2. ________________

A donde va el agua despues de usarla?

____

Una *cuenca hidrografica* es el territorio drenado por un unico rio, delimitado por montanas.

Conecta las palabras con su definicion

Turbidez	• Corriente de agua que desemboca en un río mayor o directamente al mar.
Contaminacion difusa	• Tipologia de nutrientes que se encuentran en los fertilizantes y que pueden causar crecimiento algal excesivo.
E.coli	• Contaminacion de un solo origen.
Contaminacion focal	• Tipologia de bacteria que se encuentra en el aparato digestivo de animales de sangre caliente. Cuando se ingiere, puede causar/traer enfermedad.
Nitratos y fosfatos	• Pequenos insectos aquaticos que pueden ser usados como indicadores de la calidad del agua.
Tributario o afluente	• Contaminacion de origen diverso.
Macro-invertebrados	• Medida del grado de transparencia del agua que depende de la cantidad de particulas en suspension.

Page 1

Rancho ganadero

Comunidad ecológica río arriba

Campos agrícolas

Como reaccionan los elementos vivos del ecosistema de rivera a la escorrentía?

____
____
____
____
____

La escorrentia de las aguas de tormenta contribuye a la acumulacion de contaminantes en el rio procedentes de diferentes partes de la cuenca hidrografica. Haz una lista de las difererentes variedades de escorrentia procedentes de areas naturales:

____
____
____

Haz una lista de las difererentes variedades de escorrentia procedentes de tu comunidad:

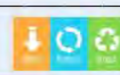
____
____
____

Ciudad

Comunidad ecológica río abajo

Cómo TU puedes ayudar a mantener la cuenca limpia?

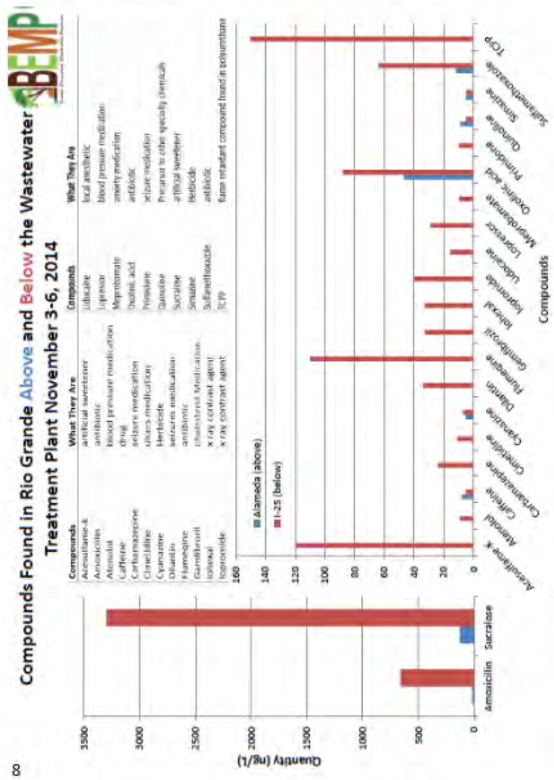
1. ________________
2. ________________
3. ________________
4. ________________
5. ________________
6. ________________
7. ________________
8. ________________



Page 2

Field Journal for outdoor study trips

Do you use any of these compounds?



8

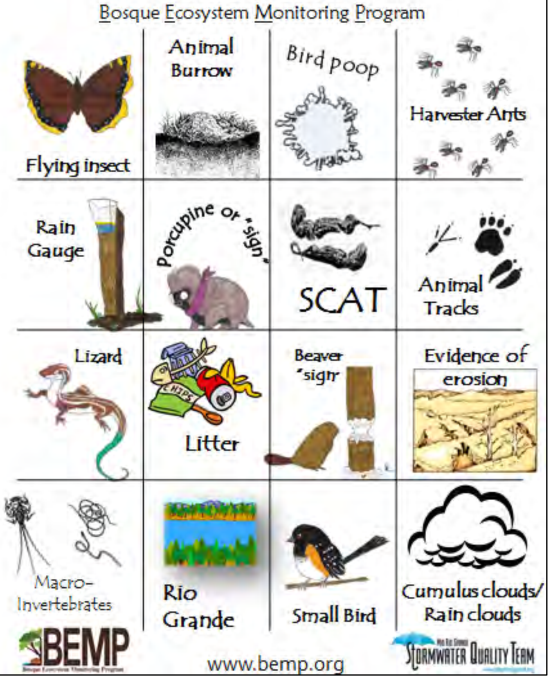
Name:______________________________

Date:______________________________

Stormwater Science

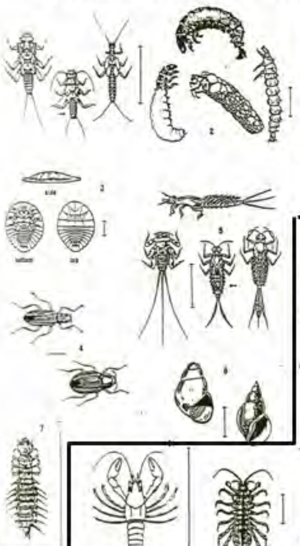
Field Journal

Bosque Ecosystem Monitoring Program

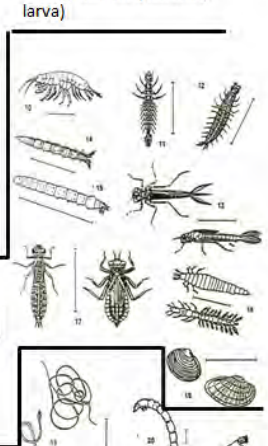


www.bemp.org

Macro-invertebrates: Ecosystem Indicators



Pollution Sensitive
1 Stonefly larva
2 Caddisfly larva
3 Water penny beetle larva
4 Riffle beetle
5 Mayfly larva
6 Gilled snail
7 Hellgrammite (dobsonfly larva)



Somewhat Pollution Tolerant
8 Crayfish
9 Sowbug
10 Scud
11 Alderfly larva
12 Fishfly larva
13 Damselfly larva
14 Watersnipe fly larva
15 Cane Fly larva
16 Beetle larva
17 Dragonfly larva
18 Clam

Pollution Tollerant
19 Aquatic worms
20 Midge fly larva
21 Black fly larva
22 Leech
23 Pouch snail
24 Other snails

Litter Survey

The San Antonio Arroyo collects runoff from all over the west side of Albuquerque, anything on the streets can end up in the arroyo. Record the litter you find throughout the day here.

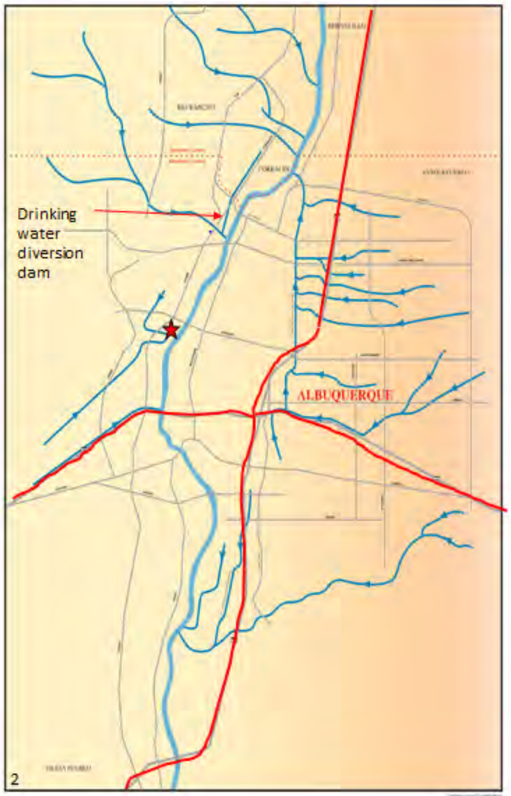
Litter type	Arroyo	Bosque
Plastic		
Paper		
Glass		
Metal		
Cigarette butts		
Dog poop		
Animal scat		
Evidence of chemicals		
Other trash		

Who is responsible?

Point source pollution- comes from a specific place

Non-point source pollution- comes from many places and people

3



Water Chemistry

	Arroyo	River
Temperature	°F / °C	°F / °C
Turbidity	JTU	JTU
Nitrate	ppm	ppm
Phosphate	ppm	ppm
pH		
Dissolved oxygen	ppm %	ppm %
E. coli	Present / Absent	Present / Absent

Temperature
8-12 °C- good
13-15 °C- fair
>15 °C- poor

Turbidity
Sources: erosion, fire
1-39 JTU- good
4--100 JTU- fair
>100 JTU- poor

Nitrates
Sources: plants, soil, fertilizer
1-4 ppm- good
5- 20 ppm- fair
>20 ppm- poor

Phosphates
Sources: plants, fertilizer, plastic
1 ppm- good
2 ppm- fair
4ppm- poor

pH
1-strong acid- poor
6-weak acid- fair
7-neutral- good
8-weak base-fair
14-strong base-poor

Dissolved Oxygen
1 ppm or 60-100% -good
4 ppm or 40-60%- fair
8 ppm or 0-40%- poor

E. coli
Sources: animal waste
E.coli will always be present in small amounts. Large amounts are harmful to humans and animals

Overall river health: (circle one)

Good Fair Poor

7

How long will it take?

Every piece of trash has a face… where and WHO did it come from? It takes just a moment for an item to be carelessly discarded where it can be washed into a river or blown in by wind, but it can take many, many years for it to completely decompose. Test your knowledge about decomposition times below by drawing a line from the item to its decomposition time.

Banana peel	1 million years
Cigarette butt	600 years
Fishing line	450 years
Styrofoam cup	200 years
Milk carton	50 years
Plastic bottle	20 years
Aluminum can	5 years
Glass bottle	3 months
Plastic bag	4 weeks

Which of these things can be reused or recycled?

____

____

4 ____

Weather Report

1. Time: ______________ am or pm
2. Today's Weather:

3. Cloud Cover: ____________ %
4. Wind: Speed: ____________ Direction: km/hr OR mph

5. Humidity: ____________ %
6. Temp: It feels like: ________ °F It actually is.... _________ °F

Journal Space

5

Middle school students at Cien Aguas International School (top right). In the field middle school students look for evidence of pollution in San Antonio Arroyo (center right) and study water quality through macro-invertebrates (bottom right). 1st grade students complete a puzzle to find the "secret messages" about protecting river habitats at Otter Day (below)

2017-2018 Stormwater Science Education Outreach Numbers

Date	Teacher	School	City	# students in classroom	# students in Field or Lab	# adults	Grade	Activity	# Presen-tations	Hours	School Level
8/16/2017		Amy Bielh HS	Albuquerque		18	2	9th	Study trip	1	1	HS
9/13/2017		Amy Bielh HS	Albuquerque		24	2	9th	Study trip	1	1	HS
10/6/2017	Sondra Lawson	Garfield STEM Middle School	Albuquerque		25	2	6th	Study trip	1	4	MS
10/23/2017		Rio Rancho Water Festival	Rio Rancho	149		28	4th	Event	6	3	ES
10/24/2017		Rio Rancho Water Festival	Rio Rancho	130		25	4th	Event	6	3	ES
11/1/2017		Amy Bielh HS	Albuquerque		24	2	9th	Study trip	1	1	HS
11/6/2017	Velia Raff	Cien Aguas International School	Albuquerque	60		2	6th	Classroom	2	2	MS
11/17/2017	Sondra Lawson	Garfield STEM Middle School	Albuquerque	85		1	6th + 7th	Classroom	3	3	MS
11/29/2017		Amy Bielh HS	Albuquerque		20	2	9th	Study trip	1	1	HS
12/4/2017	Selena Shepherd	Monte Vista Elementary	Albuquerque	25		1	5th	Classroom	1	1.5	ES
12/4/2017	Lisa Vargas	Monte Vista Elementary	Albuquerque	30		2	5th	Classroom	1	1.5	ES
12/4/2017	J. Romero, B. Delanoy	San Felipe de Neri	Albuquerque	24		1	5th	Classroom	1	1.5	ES
12/7/2017	J. Romero, B. Delanoy	San Felipe de Neri	Albuquerque		24	5	5th	Study trip	1	4	ES
12/8/2017	Selena Shepherd	Monte Vista Elementary	Albuquerque		25	2	5th	Lab	1	1.5	ES
12/8/2017	Lisa Vargas	Monte Vista Elementary	Albuquerque		30	2	5th	Lab	1	1.5	ES
12/8/2017	Larissa	Monte Vista Elementary	Albuquerque	30		2	5th	Classroom	1	1.5	ES
12/6-14/2017	Kari Daniels	Bosque School	Albuquerque	85		1	8th	Classroom	4	6	MS
1/10/2018	Alicia Ruch-Flynn	Albuquerque Institute of Math and Science	Albuquerque	50		1	7th	Classroom	2	3	MS
1/10/2018	Beverly Miller	Albuquerque Institute of Math and Science	Albuquerque	25		1	7th	Classroom	1	1.5	MS
1/31/2018	Jennifer Moss	Tony Hillerman Middle School	Albuquerque	20		1	7th/8th	Classroom	1	1.5	MS
2/6/2018	Suzy Dunnam	Jefferson Middle School	Albuquerque	75		1	7th	Classroom	5	5	MS
2/6/2018	Kathleen Nubar	The international School at Mesa del Sol	Albuquerque	25		1	8th/9th	Classroom	2	2	MS
2/8/2018	Kathleen Nubar	The international School at Mesa del Sol	Albuquerque		20	2	8th/9th	Study Trip	1	4	MS
2/12/2018	Elizabeth Landsford	Bandelier Elementary	Albuquerque	25		1	3rd	Classroom	1	1	ES
2/12/2018	Susan Fuller	Bandelier Elementary	Albuquerque	25		1	3rd	Classroom	1	1	ES

2/12/2018	Sarah Campbell	Bandelier Elementary	Albuquerque	26		2	3rd	Classroom	1	1	ES
2/12/2018	Lea Lahasa	Bandelier Elementary	Albuquerque	26		2	3rd	Classroom	1	1	ES
2/13/2018	Mary Erwin	Wilson Middle School	Albuquerque	145		1	6th	Classroom	5	5	MS
3/6/2018	Katelin Fischer	Ace Leadership High School	Albuquerque	15		1	10th	Classroom	1	1.5	HS
3/15/2018	Katelin Fischer	Ace Leadership High School	Albuquerque		15	2	10th	Study trip	1	4	HS
4/2/2018	Ashley Webb	Dolores Gonzales Elementary	Albuquerque	25		1	4th	Classroom	1	1	ES
4/2/2018	Carmen Lopez-Gaston	Dolores Gonzales Elementary	Albuquerque	18		1	4th	Classroom	1	1	ES
4/2/2018	Hilda Alvarez	Dolores Gonzales Elementary	Albuquerque	18		1	4th	Classroom	1	1	ES
4/3/2018	David Tichnell	Holy Ghost Catholic School	Albuquerque	26		1	6th	Classroom	1	1	MS
4/5/2018	David Tichnell	Holy Ghost Catholic School	Albuquerque		26	2	6th	Study trip	1	4	MS
4/9/2018	Rona Gomez	Georgia O'Keeffe Elementary	Albuquerque	27		1	5th	Classroom	1	1	ES
4/10/2018	Rona Gomez	Georgia O'Keeffe Elementary	Albuquerque	108		4	5th	Classroom	4	4	ES
4/23/2018	Holly Riviera	Holy Ghost Catholic School	Albuquerque	25		1	5th	Classroom	1	1	ES
5/9/2018	Carol Blackshear	Del Rio Academy	Belen	15		5	4th-6th	Classroom	1	1	MS
5/9/2018	Eric	Del Rio Academy	Belen	15		5	6-8th	Classroom	1	1	MS
5/10/2018	Robert Jones	Harrison Middle School	Albuquerque	165		5	6th	Classroom	5	5	MS
4/11/2018	BEMP	Otter Day	Albuquerque		103	33	Kinder/1st	Event	6	2.5	ES
4/16/2018	BEMP	Otter Day	Albuquerque		104	41	1st	Event	6	2.5	ES
4/25/2018	BEMP	BEMP Congress	Bernalillo		150	30	7th-12th	Event	38	4	MS + HS
4/27/2018	BEMP	BEMP Congress	Albuquerque		100	15	4th-6th	Event	25	4	MS
5/25/2018	BEMP	LTER Virtual Symposium	Albuquerque		34	12	6th-12th	Event	10	2.5	MS + HS
6/11/2018	BEMP	Horizons Albuquerque	Albuquerque		15	3	8th	Study trip	1	2	MS
6/26/2018	BEMP	Horizons Albuquerque	Albuquerque		15	3	6th	Study trip	1	1	MS
Total #'s				1517	730	259			159	107	

Exhibit 5
Nature Conservancy 2017-2018

The Nature Conservancy
Protecting nature. Preserving life.

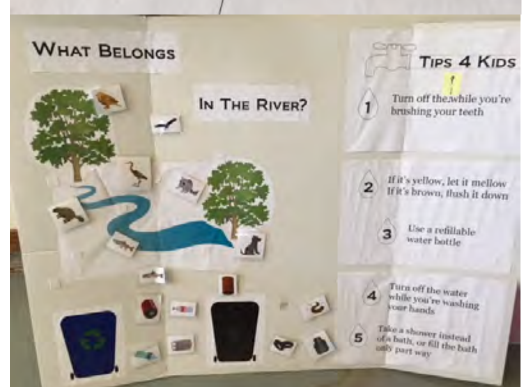
New Mexico
212 East Marcy, Suite 200
Santa Fe, New Mexico 87501

Tel (505) 988-3867 nature.org/new
Fax (505) 988-4095 mexico

The Nature Conservancy in New Mexico
Urban Conservation Educational Programs
Final Report to the City of Albuquerque: June 2018

In 2018, The Nature Conservancy engaged some specific communities, including an under-resourced area, with education/awareness programs focused on stormwater pollution emphasizing nature-based solutions. Our education program reached both adults and youth with hands-on, outdoor learning activities about stormwater impacts on the Rio Grande, how Albuquerque residents can reduce stormwater pollution, and the role of infiltration and the use of trees and other vegetation to clean our air and water. We reached approximately 100 adults and 250 children with our water messages and an additional number of people with earned media from articles featured in the Albuquerque Journal and Alibi.

Youth Education Programs:
In April, we conducted two Earth Day events connecting with students from all over Albuquerque. One event at a local Title I school, in the Barelas neighborhood included children from kindergarten through 5th grade. Activities ranged from planting a school garden, making native plant seed balls (seed bombs), soil filter experiment, stormwater bingo and learning about rainwater catchments. Other activities included a hands-on game board called "What Belongs in the River?" which was a fun way to engage younger students in understanding stormwater pollution sources. We also piloted the "Conservation Classroom" by providing curriculum on water conservation to over 100 elementary students.



A second event was hosted at Sandia Lakes for about 150 special-needs students and their families (75 adults). Students were primarily from Albuquerque Sign Language Academy, plus special-education students from various schools throughout Albuquerque Public Schools (APS) system. Participants, both youth and adults, participated in similar hands-on activities and watershed based educational curriculum. Topics included stormwater management, water quality, watershed connections, the importance of forests and mountains as water towers, drinking water sources, impacts of drought, and ecological consequences of river management.

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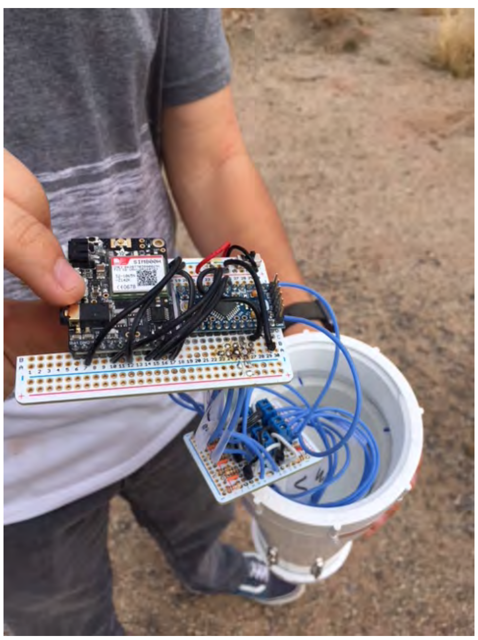
212 East Marcy, Suite 200
Santa Fe, New Mexico 87501

Tel (505) 988-3867 nature.org/newmexico
Fax (505) 988-4095

We have also engaged eight Rocky Mountain Youth Corp members, ages 17-25, in activities to learn about trees and how stormwater could serve as an asset to building a more robust tree canopy in Albuquerque. Crew members assisted with taking an inventory of and assessing the health of trees in city parks and street trees to help us understand where the gaps in tree canopy are, which trees do the best in our urban setting and identifying locations where stormwater could benefit street trees.

Finally, we participated in an afterschool program at NexGen Academy focused on technology, where students learned about stormwater management and produced a device to measure soil moisture. Using an Arduino, a small programable computer chip, the students developed a field unit that could be placed along an arroyo, acequia or small canal to measure soil moisture to inform the appropriate biofiltration plants that area could support. The unit is water tight, to be able to handle natural weather and transmits the data to a google spreadsheet in real time. It also has four sets of sensors to measure soil moisture at various depths. We worked with the students to help them understand rainfall totals, stormwater management including the types of arroyos and other channels that are used to carry stormwater, the concept of biofiltration and how it works, as well as the reasons behind why this type of data is important and how it could be used. The students diligently worked on their prototype and won first place in the State MESA competition and are competing this week in the National finals.



Adult Education Programs:
In March, we hosted a volunteer day to install 2,500 gallons of rainwater storage capacity at Dolores Gonzales Elementary School in Barelas. This installation brought in additional support from General Mills and their employees, who volunteered to install the barrels at the school. It was a great day and they made short work of the installation. We also had a volunteer who created a video of the day, which can be found here: https://vimeo.com/260859979.

The Nature Conservancy
Protecting nature. Preserving life.

New Mexico
212 East Marcy, Suite 200
Santa Fe, New Mexico 87501

Tel (505) 988-3867 nature.org/newmexico
Fax (505) 988-4095

As well, we engaged three neighborhood associations near Tijeras Arroyo through a watershed health forum to discuss stormwater management, sources of pollution and how residents can reduce their contributions. We will continue to work with these neighborhoods to help them address their local issues. Related to this, the Arid LID Coalition has doubled in the number of active members participating in our bi-monthly meetings. The group has targets for stormwater education and outreach as a primary goal for this year and we are in the process of developing a short (1-2 min) video about green stormwater infrastructure and the role it plays in arid environments. We expect the video to be released during the EPA Region 6 Stormwater conference in August. Additionally, we have engaged a small group of residential and commercial developers to understand how we might overcome barriers to the adoption of green stormwater infrastructure techniques.

Tijeras Creek is an important tributary of the Rio Grande and with its recent TMDL limits, it is an area of active restoration. The Conservancy has continued to participate in this Watershed Collaborative, which is addressing all parts of the watershed from high in the Sandias to the River. Projects such as the Cedro Restoration Project at the Cedro Creek headwaters and the Rocky Mountain Youth Corp project, funded by the Rio Grande Water Fund, which is restoring 3-4 miles of Cedro Creek, will improve conditions to reduce erosion, improve water infiltration and potentially reduce the flow of contaminants into the City's jurisdiction.

Finally, we have engaged with two local experts to develop a plant list of trees and shrubs that are suitable for five elevational transects crossing the city. These selected species account for drought tolerance, water requirements, temperature limits, invasiveness, wildlife habitat and other attributes that make them good selections for our arid City.

Marketing and Communications:
During the time of the Conservancy's contract with the city, we disseminated a media advisory about urban conservation outreach activities, which was pitched to regional media outlets (see attached). Two local newspaper outlets, The Albuquerque Journal and the Alibi produced stories about stormwater management and our education efforts. In total, between February and June, 14 stories appeared about urban conservation initiatives reaching 4.68M online and 206,000 via broadcast. These stories have a total publicity value of $16,000.

Additionally, a volunteer produced a video about the rainwater catchment project, which was disseminated through social media tools and received wide distribution through one of our partners, General Mills (see link on page 2). As well, all media coverage and releases are highlighted on the Conservancy's website and Facebook page. These educational programs were also featured in the Conservancy's spring State Director's Letter, which included a quote from Kevin Daggett, reaching more than 8,000 households in New Mexico and was distributed to 3,000 individuals through our Great Places e-newsletter.

Highlighted stories include:
June 14
http://www.koat.com/article/nature-conservancy-trains-kids-how-to-prevent-tree-loss/21351290

June 13
http://www.krqe.com/news/albuquerque-metro/students-take-part-in-annual-tree-trimming/1234185842

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Fax (505) 988-4095 mexico

April 19
https://alibi.com/feature/55803/Healthy-Plants-Healthy-Kids.html

April 19 - ABQ Journal Home Style section
http://www.pressreader.com/usa/albuquerque-journal/20180420/282948155827883

April 5
https://www.bizjournals.com/albuquerque/news/2018/04/04/nature-conservancy-opens-albuquerque-office.html?anae_ae_set1&sarticle_du&ed2018-04-04&uBTJH4DWHKt2BFfqH0OBRBLQ000b4250&t1522881870&j80857241

Exhibit 6
EarthForce 2017-2018

TO:	Kathy Verhage, City of Albuquerque
FROM:	Vince Meldrum
DATE:	Wednesday, October 3, 2018
RE:	Earth Force Progress Report/Invoice

Thank you again for your ongoing support of Earth Force. We are happy to report that we are making substantial progress toward the goals outlined in our contract with the City of Albuquerque.

Our contract outlines benchmarks in three areas: Educator Training; Volunteer Engagement/Training; and, World Water Monitoring Day. As of the end of September we have made substantial progress in each category. Please accept the following as an interim report on our progress.

Goal 1: Train 10 Educators
To date we have identified 12 educators who will be working with Earth Force this year. Of that number six received training in September two received training in the Spring of 2017, and four will be working under the umbrella of an experienced educator at Truman Middle School (will not require training). The following is a list of educators working with Earth Force during the 2017/2018:

<u>Isleta Middle School:</u>
* Loretta Ortiz - 6th Grade Teacher
* Christine Nieto - 6th Grade Teacher
* Janelle Armijo - 5th Grade Teacher
* Rebecca Vesely - Principal

<u>Truman Middle School:</u>
** Lynn Schuler - MS Teacher/MESA Leader
Michael Pedersen - MS Teacher
Jesse Winter - MS Teacher
Cilian Perez - MS Teacher
Nicholas Kadlec - MS Teacher

<u>Native American Community Academy (NACA):</u>
** Charlene Lucero - 6th and 7th Grade Science Teacher
* Tylar Rodriguez - HS Chemistry and Physics
* Rob Salazar - 7th and 6th Grade Science Teacher

** Trained in September 2017*
*** Trained Prior to September 2017*

Goal 2: Engage 7 Volunteers

Earth Force engages volunteers who support students and educators as they progress through the Earth Force process. So far, this year Earth Force has identified and has begun the process of preparing volunteers from the following organizations:

- Bureau of Indian Affairs (BIA)
- U.S. Fish and Wildlife Service,
- Sandia Pueblo Environment Department
- Isleta Pueblo Environment Department
- Bosque Ecosystem Monitoring Program (BEMP)
- Intel

Goal 3: Prepare for World Water Monitoring Day

As of the end of September we had planned two events to commemorate World Water Monitoring Day. First, we planned to host students from Truman Middle School at the Valle de Oro Urban Refuge on September 20, 2017 (that event has subsequently taken place). Second, we began working with NACA to host students for a water monitoring event at Valle de Oro (we are still finalizing a date for that event).

Attachment 9

Daytona Transit Facility Illicit Discharges

March 16, 2018

Ms. Shellie Eaton
City of Albuquerque
Department of Municipal Development, Storm Drainage Design
P.O. Box 1293
Room 301
Albuquerque, New Mexico 87103

Re: Sampling and Analysis Plan, Illicit Discharge Investigation at ABQ Ride West Side Transit Facility (Daytona), Albuquerque, New Mexico

Dear Ms. Eaton:

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this sampling and analysis plan (SAP) for submittal to the City of Albuquerque (COA). The purpose of the SAP is to characterize the presence or absence of contaminants in the stormwater system at the ABQ Ride West Side Transit Facility (Daytona facility). The SAP was developed through coordination and consultation with COA and Daytona staff. It provides pertinent background information, sample locations and collection methods, sample handling and analysis procedures, and reporting information.

Background

The purpose of this investigation is to characterize the volume and constituents of possible illicit discharges to the storm drain system at the Daytona facility. The site plan from the September 2015 Storm Water Pollution Prevention Plan (Attachment 1) shows the components of the storm drain system at the facility. The illicit discharges occurred from 2014 to 2016, when Daytona staff routinely pumped washwater from two sumps to the stormwater system. The storm sewer system discharges to a series of detention ponds. The first detention pond in the series is located south of Daytona Road, near the facility's southeast corner (Attachment 1)

The sumps are located at two locations at the property: the bus wash facility and the steam clean bay (Attachment 1). The sumps are approximately 10 feet by 7 feet by 9 feet (capacity of approximately 4,700 gallons), and collect runoff from vehicle maintenance activities such as vehicle washing and repair. The sumps are physically connected to oil/water separators and subsequently to the sanitary sewer. The waste distribution system had been unavailable for a number of years due to malfunctioning connection equipment.

The constituents of the discharge are postulated to contain cleaning products and automobile fluids such as oil, grease, fuel, and transmission fluids. The volume of the discharges is currently unknown. Employee testimony states that the illicit discharges occurred approximately every other week for approximately two years. Records kept by Daytona staff

Daniel B. Stephens & Associates, Inc.

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Albuquerque, NM 87109 | FAX 505-822-8877

estimate that approximately 64 documented incidences of discharge to the storm sewer occurred from 2014 to 2016. Daytona staff indicated that there were likely more undocumented discharges of unknown volume. The volume of the discharges is unknown, but the tank capacities are approximately 4,700 gallons each. If both tanks were completely emptied biweekly, the total volume discharged to the storm drain over a period of three years is calculated to be 733,200 gallons.

The water and sediment in the sumps were also removed and disposed of by a subcontractor, AAA Pumping, at least 12 times between August 2014 and August 2016. It is estimated that approximately 95,000 gallons of fluid and sand were extracted from the facility sumps by AAA Pumping.

Site Inspection

On February 2, 2018, DBS&A visited the Daytona facility to examine the facility's stormwater system and to meet with Mr. Jim Carrillo to discuss site activities that could contribute constituents to the discharge. The visit included on-the-ground field reconnaissance to visually screen for the most appropriate sampling locations. Specifically, the stormwater system inlets and detention pond outfall were examined to determine possible sampling locations.

A mixture of washwater, cleaners, and nonaqueous-phase liquid (NAPL) was observed in the sumps at the bus wash facility and steam clean bay. It was postulated that the washwater contained residue from engine cleaning activities. Washwater constituents could include sediment, cleaning products, and automobile fluids such as oil, grease, fuel, and transmission fluids. Cleaning products observed at the bus wash facility included Simonez Pass 2 (alkaline liquid cleaning compound) and Buckshot 12 Gauge (heavy duty general purpose degreaser) at the steam clean bay.

After examination of the stormwater system, it was determined that the storm drain inlets located near the wash building and steam clean bay, where the illicit discharge occurred, contained a minor amount of sediment and trash, and did not show obvious signs of staining due to the illicit discharge. The concrete storm drain vaults do not contain adequate soil or residue for sample collection. Entry of the vaults was not permissible due to their depth (>15 feet) and construction. Observations were therefore made from ground surface through the surface grates.

An adequate amount of soil suitable for sample collection was found within and directly downstream of the storm drain outfall against concrete baffle walls located at the first detention pond. As shown in Attachment 1, the outfall is connected to the Daytona facility and storm drains located on Daytona Road. The outfall drains into the detention pond via a concrete low-flow conveyance that runs the length of the pond. The interior of the 60-inch-diameter outfall pipe was examined upstream of the pond to determine the extent of sediment deposition. Sediment was found only in the storm drain approximately 5 feet upstream of the outfall. The pipe sections located upstream of the outfall were free of sediment, but did show signs of staining. Staining was also noted on the base of the outfall pipe. A small amount of water and ice was observed in the pipe. Two additional outlets are present in the detention pond and discharge onto concrete low-flow conveyances that connect with the conveyance from the Daytona Facility.

Sample Collection

The purpose of collecting sediment samples for analytical analysis is to determine if the pond contains contaminated sediments that require removal. Sediment samples will be collected at the terminus of the storm drain outfall located at the first detention pond (Table 1, Attachments 2a and 2b) and from surface sediments located in detention pond #1 and detention pond #2. Sample #1 - Outfall will be collected directly downstream of the storm drain outfall against the concrete baffles. Sample # 2 - Pond will be collected approximately 20 feet downstream of the outlet and Sample #3 - Pond will be collected at southern end of the detention pond #1. Ponded stormwater and/or discharge was observed at the southern end of detention pond #1 in a Google Maps aerial photograph taken sometime between March 2014 and November 2015.

Care will be taken to collect Sample #2 - Pond before the convergence of the three concrete low-flow conveyances present in the pond. Sample #4 - Pond will be collected from the outlet to detention pond # 2. Sample #5 - Background will be collected from undisturbed natural land near the facility. Additional volume will be collected for possible toxicity characteristic leaching procedure (TCLP) analysis at a later date. The TCLP analysis is designed to determine the mobility of organic and inorganic analytes present in liquid, solid, and multiphasic wastes.

Table 1. Sediment Sampling Locations

Sample Number	Location Name	Location Type
1	Detention pond #1	Concrete outlet
2	Detention pond #1	Bottom sediments
3	Detention pond #1	Bottom sediments
4	Detention pond #2	Bottom sediments
5	Background	Undisturbed land

During the sampling event, photographs will be taken and global positioning system (GPS) coordinates (3-meter accuracy) of sample locations will be recorded.

Sample Analysis

Hall Environmental Analytical Laboratory (HEAL) will perform all chemical analyses of the soil samples in accordance with their corporate quality assurance program.

Soil samples will be analyzed for RCRA 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using U.S. Environmental Protection Agency (EPA) method 6010/6020/7470, additional metals (molybdenum, copper, aluminum, and zinc) using EPA method 200.8/6020, volatile organic compounds (VOCs) using EPA method 8260B, semivolatile organic compounds (SVOCs) using EPA method 8270 (SIMS-PAH), chloride using EPA method 300, and diesel range and gasoline range organics (DRO and GRO) using EPA method 8015 mod. Standard laboratory turnaround time for sample analysis is 14 calendar days from receipt of the samples.

Sample Handling

Sediment samples will be collected at or near the proposed locations shown on Attachment 1. To minimize the potential for cross contamination, sediment samples will be collected at ground surface using stainless steel spoons, which will be cleaned and decontaminated prior to reuse. Sediment will be collected in appropriate sample containers provided by HEAL and will be placed in a cooler containing ice immediately following collection. Table 2 summarizes the requirements for sample containers and sample preservation for laboratory analyses.

Table 2. Required Volume, Containers, Preservatives, and Holding Times

Soil Laboratory Analyte	Method	Volume and Container	Preservative	Holding Time [a]
RCRA 8 metals [b]	EPA 6010/6020/ 7470	4-oz glass jar	Store at 4 ± 2°C	6 months
Additional metals [c]	EPA 200.8/6020	4-oz glass jar	Store at 4 ± 2°C	6 months
DRO	EPA 8015B	4-oz glass jar	Store at 4 ± 2°C	14 days
GRO	EPA 8015B	4-oz glass jar	Store at 4 ± 2°C	14 days
VOCs	EPA 8260B	4-oz glass jar	Store at 4 ± 2°C	14 days
PAH-SIMS	EPA 8270	4-oz glass jar	Store at 4 ± 2°C	14 days
Chloride	EPA 300	4-oz glass jar	Store at 4 ± 2°C	28 days

[a] Holding time is measured from the time of sample collection to the time of sample extraction and analysis.
[b] Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.
[c] Molybdenum, copper, aluminum, and zinc.

Sample Identification

A standardized sample identification (ID) format will be used to maintain a record of where each soil sample was collected. Each sample ID label will include the site name and collection date. For example, a sample collected on February 14, 2018 from the proposed Outfall sample location would be labeled “Outfall_02142018.”

Record Keeping

During sample collection, DBS&A field personnel will follow DBS&A standard operating procedures, and will document and record all field activities in permanently bound field logbooks with sequentially numbered pages. The logbook will list the contract name and number, site name, and names of service client and project manager. At a minimum, the following information will be recorded in the field logbook:

- Name and affiliation of all on-site personnel or visitors
- Weather conditions during field activities
- Summary of activities and significant events
- References to any forms that contain specific information
- Discussions of problems encountered and their resolution
- Discussions of deviations from the sampling plan or other governing documents
- Descriptions of all photographs taken

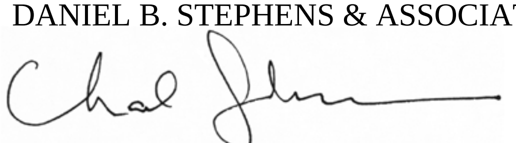
Data Interpretation and Analysis

Following completion of field activities and receipt of analytical results from the laboratory, DBS&A will submit an electronic copy of the draft report summarizing investigation activities and results to the COA for review. All field and laboratory data will be synthesized and interpreted by DBS&A. After the COA has reviewed and accepted the draft report, a final letter report of activities and results will be prepared that includes complete analytical data reports and electronic data deliverables (EDDs) from the laboratory.

We appreciate the opportunity to serve the City of Albuquerque on this important project. If you have any questions regarding this sampling plan, please call me at (505) 822-9400.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

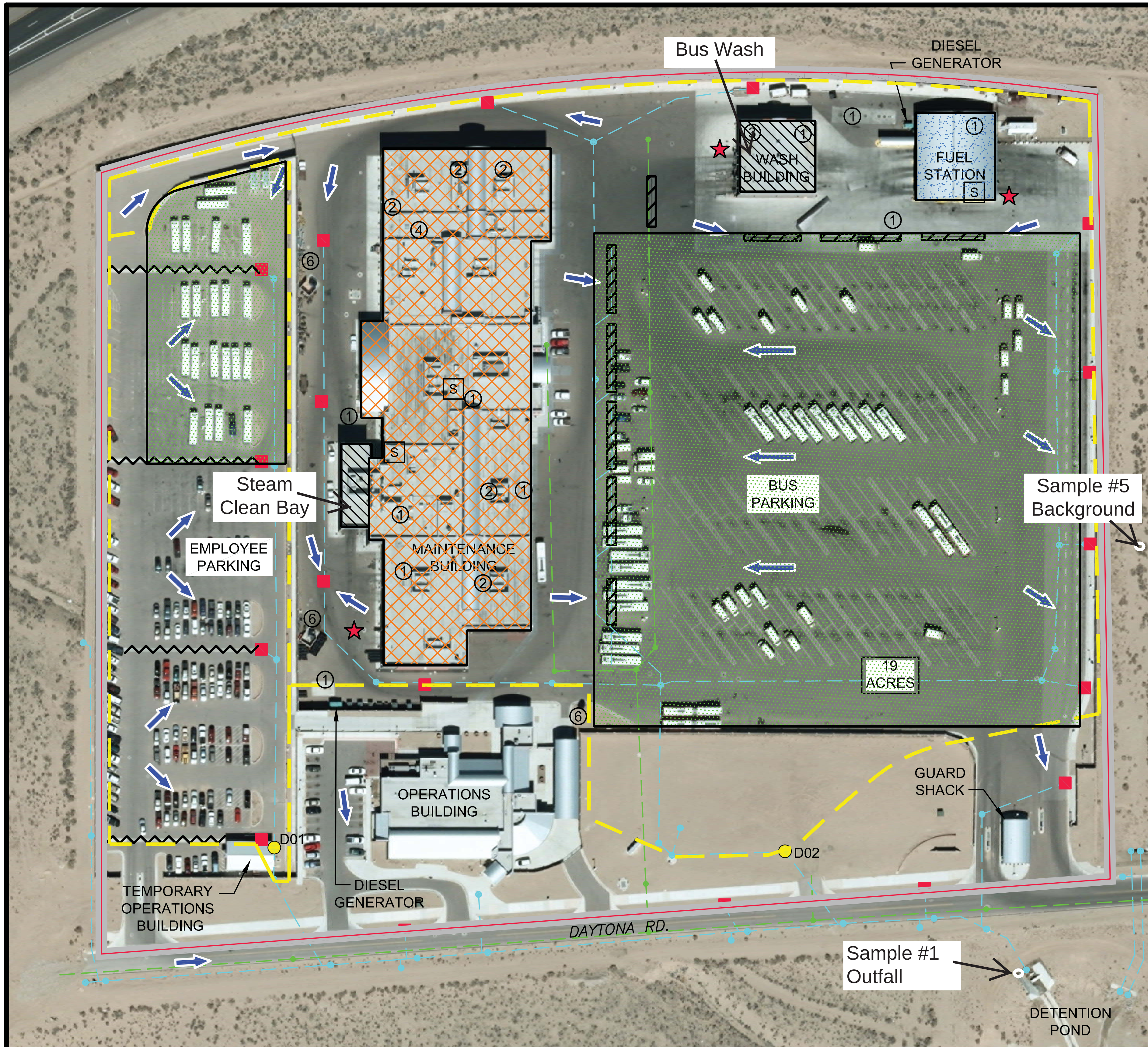


Chad Johannesen
Project Manager

CJ/rpf
Attachments

Attachment 1

Site Plan



LEGEND

Symbol	Description
★	OIL-WATER SEPARATOR (OWS) (SEE NOTE 1)
	SANITARY SEWER AND MANHOLE
	STORM DRAIN AND MANHOLE
	STORM DRAIN INLET
	STORM DRAIN TRENCH DRAIN
	VEHICLE AND EQUIPMENT STORAGE
	VEHICLE AND EQUIPMENT MAINTENANCE
	VEHICLE AND EQUIPMENT WASHING
	VEHICLE AND EQUIPMENT FUELING
19 ACRES	SIZE OF PROPERTY IN ACRES
	SURFACE WATER FLOW DIRECTION
	DRAINAGE BOUNDARY
	FACILITY BOUNDARY
D01	OUTFALL/MONITORING POINT & ID #
S	SPILL RESPONSE MATERIALS
	CONCRETE GUTTER
1	SPILLS/LEAKS (PAST 3 YEARS) (REFER TO SECTION 2 OF THE SWPPP FOR DETAILED INFORMATION ON EACH SPILL)

NOTE:

1. FUEL STATION, WASH BUILDING AND MAINTENANCE BUILDING PROVIDED WITH SANITARY SEWER TRENCH DRAINS WHICH DISCHARGE TO OWS.

MATERIAL HANDLING

① FUEL/OILS
② DEGREASING
③ SALT STORAGE
④ PAINTING/STRIPPING
⑤ HERBICIDE/PESTICIDE STORAGE
⑥ WASTE HANDLING/DISPOSAL
⑦ METALS STORAGE

CDM Smith

City of Albuquerque Transit Department
Storm Water Pollution Prevention Plan (SWPPP)
ABQ Ride West Side Transit Facility (Daytona)

Figure No. 2A
Site Plan
September 2015

Attachment 2

Sample Locations

S:\PROJECTS\WR14.0049.01_COA_STORMWATER\GIS\MXDS\MST\DAYTONA_SAMPLE LOCATIONS 8 X11_REVISEDMARCH2018.MXD

0 50 100150200
Feet

N

Explanation

Sample location

CITY OF ALBUQUERQUE

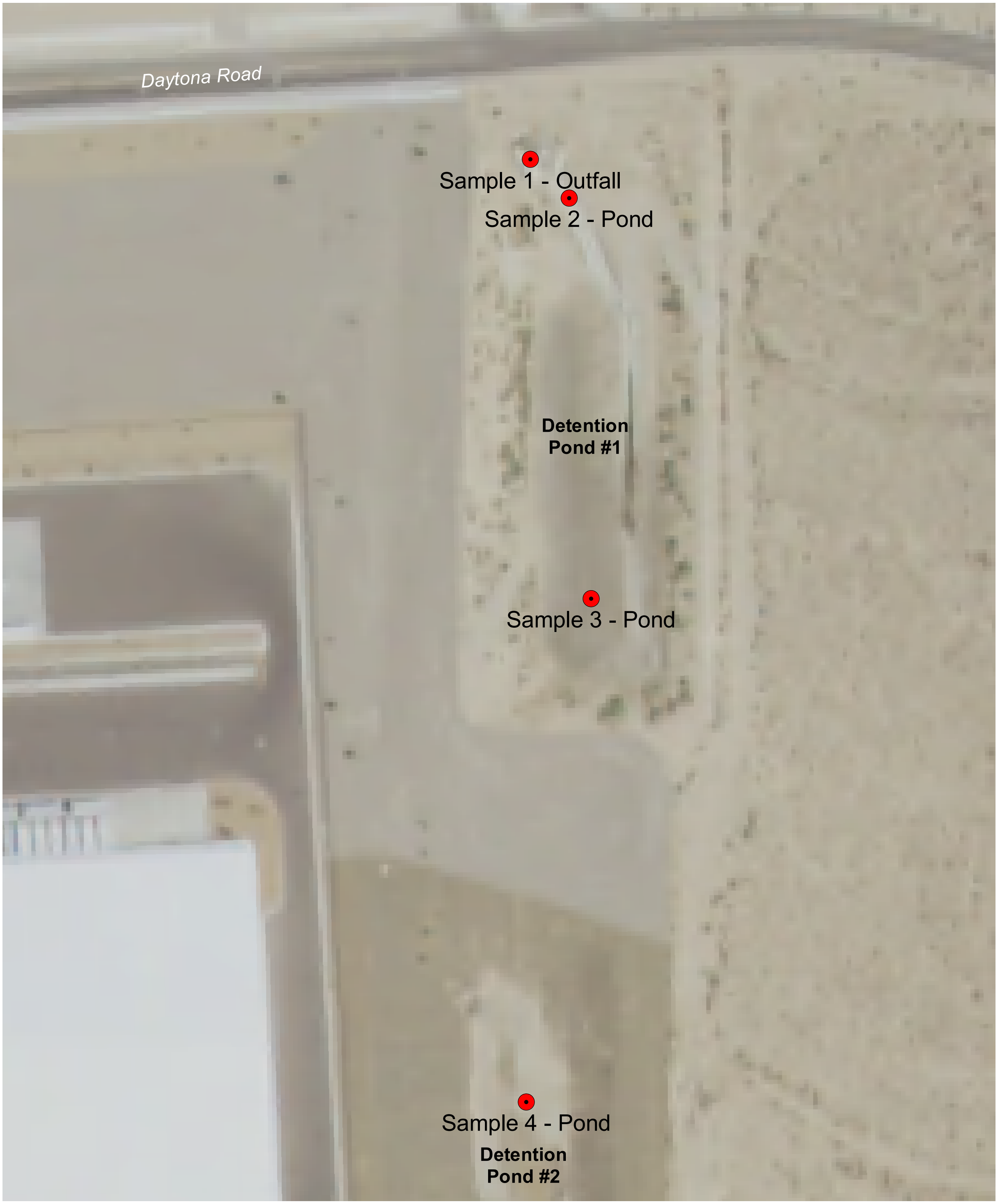
Daytona Illicit Discharge Investigation

Attachment 2a

Daniel B. Stephens & Associates, Inc.

3/16/2018

CMJ DB17.1158



0 50 100 150 200 Feet

N

Explanation

Sample location

CITY OF ALBUQUERQUE

Daytona Illicit Discharge Investigation

Daniel B. Stephens & Associates, Inc.

3/16/2018

CMJ DB17.1158

Attachment 2b

May 9, 2018

Ms. Shellie Eaton
City of Albuquerque
Department of Municipal Development, Storm Drainage Design
P.O. Box 1293
Room 301
Albuquerque, New Mexico 87103

Re: Results of Sediment Sampling at ABQ Ride West Side Transit Facility (Daytona), Albuquerque, New Mexico

Dear Ms. Eaton:

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this letter report summarizing results of sediment sampling at the ABQ Ride West Side Transit Facility (Daytona facility) for the City of Albuquerque (COA). The purpose of the investigation is to characterize the presence or absence of contaminants in the facility's stormwater system due to possible illicit discharges. DBS&A personnel conducted the sediment sampling at the facility's stormwater outfall and stormwater detention ponds. The sampling effort included the collection of background sediment samples upgradient of the facility discharge. Background information, sample locations and collection methods, sample handling and analysis procedures, and reporting information were also described in the March 2018 sampling plan.

Background

The purpose of the March 2018 sampling event was to determine the presence or absence of near-surface constituents related to possible illicit discharges to the storm drain system at the Daytona facility. The illicit discharges occurred from 2014 to 2016, when Daytona staff routinely pumped washwater from two sumps to the stormwater system.

The site plan from the September 2015 storm water pollution prevention plan (Attachment 1) shows the components of the storm drain system at the facility. The stormwater system discharges to a series of detention ponds. The first detention pond in the series is located south of Daytona Road, near the facility's southeast corner (Attachment 1).

There are sumps at two locations at the property: the bus wash facility and the steam clean bay (Attachment 1). The sumps are approximately 10 feet by 7 feet by 9 feet (capacity of approximately 4,700 gallons), and collect runoff from vehicle maintenance activities such as vehicle washing and repair. The sumps are physically connected to oil/water separators and subsequently to the sanitary sewer. The waste distribution system was unavailable for a number of years due to malfunctioning connection equipment.

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

The discharges are postulated to have contained cleaning products and automobile fluids such as oil, grease, fuel, and transmission fluids. The volume of the discharges is currently unknown. Employee testimony states that the illicit discharges occurred approximately every other week for approximately two years. Records kept by Daytona staff estimate that approximately 64 documented incidences of discharge to the storm sewer occurred from 2014 to 2016. Daytona staff indicated that there were likely more undocumented discharges of unknown volume. Although the volume of the discharges is unknown, the tank capacities are approximately 4,700 gallons each. If both tanks were completely emptied biweekly, the total volume discharged to the storm drain over a period of three years is calculated to be 733,200 gallons. The water and sediment in the sumps were also removed and disposed of by a subcontractor, AAA Pumping, at least 12 times between August 2014 and August 2016. It is estimated that approximately 95,000 gallons of fluid and sand were extracted from the facility sumps by AAA Pumping.

Site Inspection

On February 2, 2018, DBS&A visited the Daytona facility to examine the facility's stormwater system and to meet with Mr. Jim Carrillo to discuss site activities that could contribute constituents to the discharge. During the facility inspection, a mixture of washwater, cleaners, and nonaqueous-phase liquid (NAPL) was observed in the sumps at the bus wash facility and steam clean bay. It was postulated that the washwater contained residue from engine cleaning activities. Cleaning products observed included Simonez Pass 2 (alkaline liquid cleaning compound) at the bus wash facility and Buckshot 12 Gauge (heavy-duty general purpose degreaser) at the steam clean bay.

The site inspection visit included on-the-ground field reconnaissance of the facility's stormwater system to visually screen for the most appropriate sampling locations. It was determined that the storm drain inlets located near the wash building and steam clean bay, where the illicit discharge occurred, contained a minor amount of sediment and trash, and did not show obvious signs of staining due to the illicit discharge. The concrete storm drain vaults do not contain adequate soil or residue for sample collection. Entry into the vaults was not permissible due to their depth (>15 feet) and construction.

The facility's stormwater system outfall into the first detention pond (Attachment 1) contained an adequate amount of soil suitable for sample collection. The interior of the 60-inch-diameter outfall pipe was examined upstream of the pond to determine the extent of sediment deposition. Sediment was found only in the pipe approximately 5 feet upstream of the outfall and directly against concrete baffle walls at the pipe terminus. Staining on the pipe was noted at the base of the outfall pipe and the pipe sections located upstream of the outfall.

The facility's stormwater system outfall discharges to a concrete low-flow conveyance. Two additional outlets are present in the detention pond, and discharge onto concrete low-flow conveyances that connect with the conveyance from the Daytona facility.

Sample Collection

On March 20, 2018, sediment samples were collected for analysis following the approved March 2018 sampling and analysis plan. A total of 5 locations were sampled in the investigation (Attachments 1 and 2). Sediment samples were collected at the facility's stormwater system outfall (Table 1 and Attachment 2) and locations within detention pond #1 and detention pond #2. For comparison purposes, a representative background sediment sample was collected from a natural arroyo channel located upgradient of the facility discharge and just east of the facility parking lot.

Sediment samples were collected approximately 2 inches below ground surface, and were stored in sealed glass containers on ice until delivered to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico with full chain of custody documentation. To minimize the potential for cross-contamination, sediment samples were collected at ground surface using stainless steel spoons, which were cleaned and decontaminated prior to reuse. Sediment was collected in appropriate sample containers provided by HEAL.

A total of 2 inches of the topmost sediments were cleared, and samples were collected from an approximately 5-inch by 5-inch by 3-inch area. Site activities are documented in the field notes provided as Attachment 3. Global positioning system (GPS) coordinates of the sample locations were taken during the sampling event (Table 1). Photographs of the sample locations are provided in Attachment 4. Sediment descriptions and observations are included in Table 1 and Attachment 3. Sample locations are generally described as follows:

- Sample #1 - Background was collected from undisturbed natural land upstream of the facility discharge and just east of the facility building.
- Sample #2 - Outfall was collected directly downstream of the storm drain outfall against the concrete baffles. The outfall is connected to the Daytona facility and into the detention pond via a concrete low-flow conveyance that runs the length of the pond.
- Sample # 3 - Pond 1A was collected approximately 20 feet downstream of the outlet. Sediment was collected from a location next to the concrete-lined conveyance, before the convergence of the three conveyances. Staining was observed along the concrete low-flow conveyances.
- Sample #4 - Pond 1B was collected at the southern end of detention pond #1. A puddle of standing water with an area of approximately 150 square feet was observed roughly 3 feet from the Pond 1B sample location. Color layering was visible in the sediments with a darker brown/black layer 3 to 4 inches deep. Sediments from the various layers were captured in the Pond 1B sample.
- Sample #5 - Pond 2 was collected from the outlet to detention pond #2. Standing water was observed in the southeastern portion of detention pond #2 with an area of approximately 2 square feet. The Pond 2 sample location was approximately 8 feet north of the standing water.

Sample Analysis

All samples were submitted to HEAL for analysis of Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using U.S. Environmental Protection Agency (EPA) method 6010/6020/7470, additional metals (molybdenum, copper, aluminum, and zinc) using EPA method 200.8/6020, volatile organic compounds (VOCs) using EPA method 8260B, semivolatile organic compounds (SVOCs) using EPA method 8270 (SIMS-PAH), chloride using EPA method 300, and diesel range (DRO) and gasoline range organics (GRO) using EPA method 8015B.

Additional volume was collected and is being stored at HEAL for possible toxicity characteristic leaching procedure (TCLP) analysis at a later date. The TCLP analysis is designed to determine the mobility of organic and inorganic analytes present in liquid, solid, and multiphasic wastes.

Results of Laboratory Analysis

Laboratory analytical results are summarized in Table 2. Standards are listed in Table 2 for the analytes that have a New Mexico Environment Department (NMED) risk assessment standard (https://www.env.nm.gov/wp-content/uploads/2016/11/NMED_SSG_VOL-I_-March_2017_revised.pdf). Standards shown are computed standards based on the New Mexico groundwater (NMGW) standard or the maximum contaminant limit (MCL) using soil screening levels (SSLs), dilution attenuation factor (DAF) 1. Complete laboratory reports are provided in Attachment 5.

Concentrations of SVOCs, VOCs, chloride, GRO, cadmium, mercury, molybdenum, selenium and silver were reported to be below the laboratory detection limit in all five sediment samples. DRO was detected in Pond 1B sediments at a concentration of 100 milligrams per kilogram (mg/kg), which is below the NMGW SSL DAF 1 standard of 1,000 mg/kg.

Aluminum, barium, chromium, copper, lead, and zinc were detected in all five sediment samples. Detected concentrations of aluminum, chromium, copper, and zinc are below the NMGW SSL DAF 1 soil standard at all sampling locations. Detected aluminum concentrations ranged from 2,800 to 8,200 mg/kg. Barium, chromium, copper, lead, and zinc concentrations were above the detection limit in all five sediment sampling locations. Detected concentrations of chromium ranged from 2.6 to 6.8 mg/kg, with the highest concentration in the sediments collected at Pond 1B. Pond 1B also contained the highest concentrations of copper, lead, and zinc which ranged from 4.0 to 32 mg/kg, 2.9 to 8.6 mg/kg, and <2.4 to 69 mg/kg, respectively.

Barium and lead were detected at concentrations above the NMGW SLL DAF 1 sediment standard. Barium concentrations ranged from 75 to 140 mg/kg, with Background, Pond 1B and Pond 2 concentrations above the NMGW SSL DAF 1 standard. Samples collected at all five locations were found to contain concentrations of lead above the NMGW SSL DAF 1 standard.

Conclusions

Review of the laboratory analytical data indicates that there are metals present at detectable concentrations in all sediment samples collected in this investigation. Of these detected analytes, barium and lead were detected at concentrations above the NMGW SSL DAF 1 soil standards. Because barium and lead were also detected at concentrations above the standard in the background sample, the Daytona facility illicit discharge described in the background section does not appear to be responsible for the standard exceedance in barium and lead. DRO was only detected at a concentration above laboratory detection limits in the Pond 1B sediments, at a concentration far below applicable standards.

Field observations and laboratory analytical results for samples collected on March 20, 2018 did not capture evidence of contaminated soil. Based on these results, additional sampling in support of the illicit discharge investigation is not warranted.

We appreciate the opportunity to serve the City of Albuquerque on this important project. If you have any questions regarding this sediment sampling report, please call me at (505) 822-9400.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Chad Johannesen
Project Manager

CJ/rpf
Attachments

Tables

Table 1. Sample Locations, March 20, 2018

Location Number	Location Name	Location Description	Sediment Description	Sample Name	Coordinates WGS 84	
					Latitude	Longitude
1	Background	Arroyo upstream and east of the Daytona facility	Light reddish brown, dry	Background_20180320	35.08958	–106.73238
2	Outfall	Outfall pipe	Light reddish brown, moist	Outfall_20180320	35.08812	–106.73273
3	Pond 1 A	Near conveyance, a few inches east of the concrete low-flow conveyance running between the outfall and the detention pond	Light reddish brown, dry	Pond1A_20180320	35.08794	–106.73259
4	Pond 1 B	Detention pond, near lowest point at the southern end of the pond	Light reddish brown with patches of black, moist to wet	Pond1B_20180320	35.08707	–106.73248
5	Pond 2	Detention pond, near lowest point at the southern end of the pond	Dark reddish brown with a ½-inch layer of black soil, wet	Pond2_20180320	35.08605	–106.73273

Table 2. Sediment Sampling Analytical Results

Analyte	Concentration (mg/kg)					
	Soil Standard [a]	Background	Outfall	Pond 1A	Pond 1B	Pond 2
Chloride	—	<30	<30	<30	<30	<30
Diesel range organics (DRO)	1,000	<9.6	<9.7	<9.6	100	<9.7
Gasoline range organics (GRO)	—	<4.7	<4.7	<4.7	<5.0	<4.7
Aluminum	—	5,700	2,800	5,400	7,800	8,200
Arsenic	0.29	<2.5	<2.4	<2.4	<2.5	<2.5
Barium	82.35	100	75	80	140	94
Cadmium	0.38	<0.099	<0.097	<0.097	<0.099	<0.10
Chromium	1,800	2.6	4.2	3.8	6.8	5.6
Copper	45.73	4.9	8.2	4.0	32	6.2
Lead	0.0026	3.2	3.1	2.9	8.6	3.1
Mercury	0.10	<0.033	<0.031	<0.032	<0.033	<0.032
Molybdenum	—	<0.40	<0.39	<0.39	<0.40	<0.40
Selenium	0.26	<2.5	<2.4	<2.4	<2.5	<2.5
Silver	—	<0.25	<0.24	<0.24	<0.25	<0.25
Zinc	—	17	<2.4	21	69	45
Naphthalene	—	<0.02	<0.02	<0.19	<0.02	<0.02
1-Methylnaphthalene	—	<0.02	<0.02	<0.19	<0.02	<0.02
2-Methylnaphthalene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Acenaphthylene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Acenaphthene	0.0015	<0.02	<0.02	<0.19	<0.02	<0.02
Fluorene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Phenanthrene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Anthracene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Fluoranthene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Pyrene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Benz(a)anthracene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Chrysene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Benzo(b)fluoranthene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Benzo(k)fluoranthene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Benzo(a)pyrene	0.18	<0.02	<0.02	<0.19	<0.02	<0.02
Dibenz(a,h)anthracene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Benzo(g,h,i)perylene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Indeno(1,2,3-cd)pyrene	—	<0.02	<0.02	<0.19	<0.02	<0.02
Benzene	0.0021	<0.023	<0.023	<0.023	<0.025	<0.024

[a] New Mexico groundwater soil screening level, DAF 1 (https://www.env.nm.gov/wp-content/uploads/2016/11/NMED_SSG_VOL-I_-March_2017_revised.pdf)
mg/kg = Milligrams per kilogram

Table 2. Sediment Sampling Analytical Results
Page 2 of 3

Analyte	Concentration (mg/kg)					
	Soil Standard [a]	Background	Outfall	Pond 1A	Pond 1B	Pond 2
Toluene	0.56	<0.047	<0.047	<0.047	<0.050	<0.047
Ethylbenzene	0.62	<0.047	<0.047	<0.047	<0.050	<0.047
Methyl tert-butyl ether (MTBE)	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,2,4-Trimethylbenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,3,5-Trimethylbenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,2-Dichloroethane (EDC)	0.00	<0.047	<0.047	<0.047	<0.050	<0.047
1,2-Dibromoethane (EDB)	0.000012	<0.047	<0.047	<0.047	<0.050	<0.047
Naphthalene	—	<0.094	<0.094	<0.093	<0.10	<0.095
1-Methylnaphthalene	—	<0.19	<0.19	<0.19	<0.20	<0.19
2-Methylnaphthalene	—	<0.19	<0.19	<0.19	<0.20	<0.19
Acetone	—	<0.7	<0.7	<0.7	<0.75	<0.71
Bromobenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
Bromodichloromethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
Bromoform	—	<0.047	<0.047	<0.047	<0.050	<0.047
Bromomethane	—	<0.14	<0.14	<0.14	<0.15	<0.14
2-Butanone	—	<0.47	<0.47	<0.47	<0.50	<0.47
Carbon disulfide	—	<0.47	<0.47	<0.47	<0.50	<0.47
Carbon tetrachloride	0.0018	<0.047	<0.047	<0.047	<0.050	<0.047
Chlorobenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
Chloroethane	—	<0.094	<0.094	<0.093	<0.10	<0.095
Chloroform	—	<0.047	<0.047	<0.047	<0.050	<0.047
Chloromethane	—	<0.14	<0.14	<0.14	<0.15	<0.14
2-Chlorotoluene	—	<0.047	<0.047	<0.047	<0.050	<0.047
4-Chlorotoluene	—	<0.047	<0.047	<0.047	<0.050	<0.047
cis-1,2-DCE	—	<0.047	<0.047	<0.047	<0.050	<0.047
cis-1,3-Dichloropropene	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,2-Dibromo-3-chloropropane	0.000070	<0.094	<0.094	<0.093	<0.10	<0.095
Dibromochloromethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
Dibromomethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,2-Dichlorobenzene	0.45	<0.047	<0.047	<0.047	<0.050	<0.047
1,3-Dichlorobenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,4-Dichlorobenzene	0.056	<0.047	<0.047	<0.047	<0.050	<0.047
Dichlorodifluoromethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,1-Dichloroethane	—	<0.047	<0.047	<0.047	<0.050	<0.047

[a] New Mexico groundwater soil screening level, DAF 1 (https://www.env.nm.gov/wp-content/uploads/2016/11/NMED_SSG_VOL-I_-March_2017_revised.pdf)
mg/kg = Milligrams per kilogram

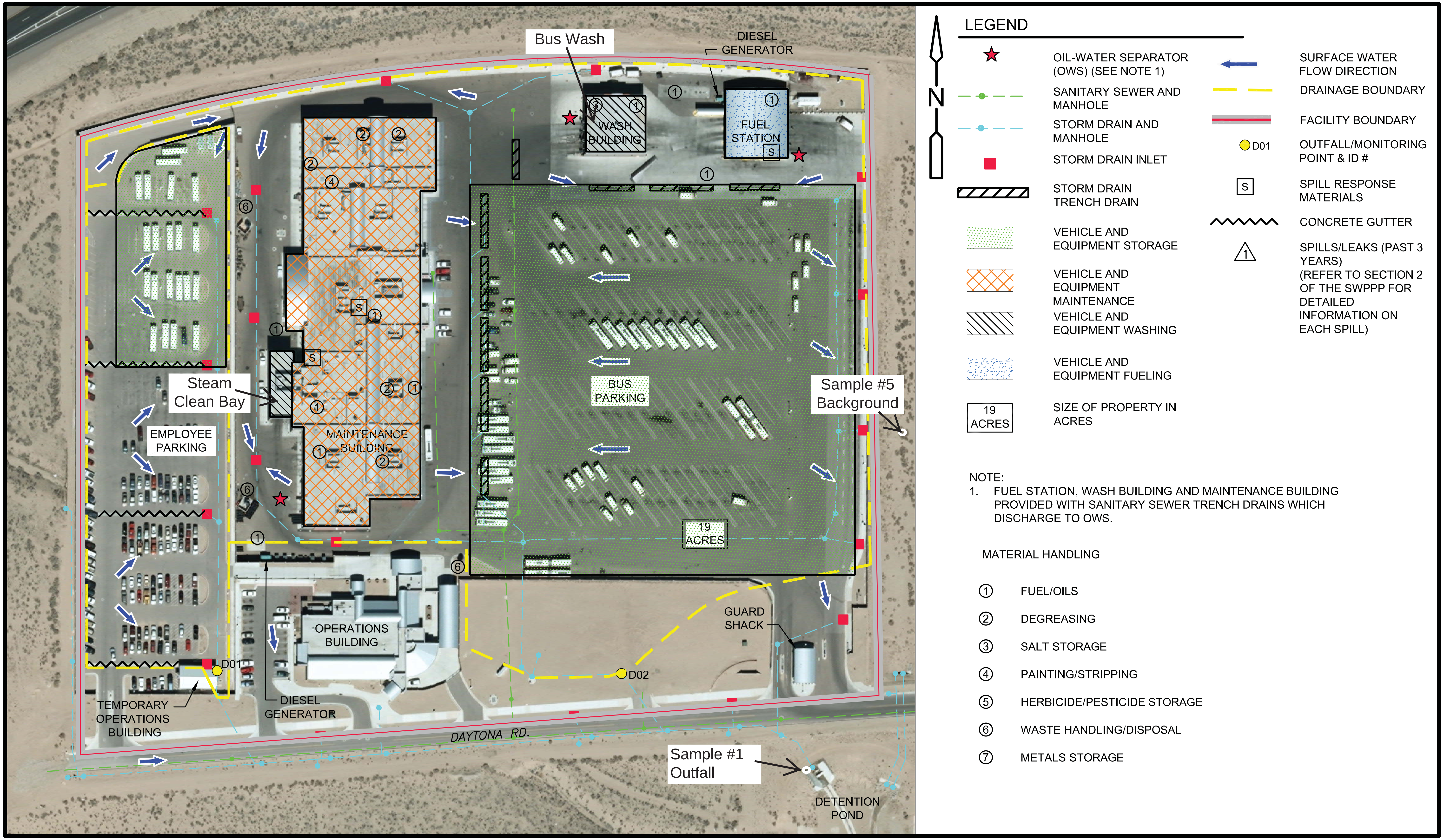
Table 2. Sediment Sampling Analytical Results
Page 3 of 3

Analyte	Concentration (mg/kg)					
	Soil Standard [a]	Background	Outfall	Pond 1A	Pond 1B	Pond 2
1,1-Dichloroethene	0.0024	<0.047	<0.047	<0.047	<0.050	<0.047
1,2-Dichloropropane	0.0014	<0.047	<0.047	<0.047	<0.050	<0.047
1,3-Dichloropropane	—	<0.047	<0.047	<0.047	<0.050	<0.047
2,2-Dichloropropane	—	<0.094	<0.094	<0.093	<0.10	<0.095
1,1-Dichloropropene	—	<0.094	<0.094	<0.093	<0.10	<0.095
Hexachlorobutadiene	—	<0.094	<0.094	<0.093	<0.10	<0.095
2-Hexanone	—	<0.47	<0.47	<0.47	<0.50	<0.47
Isopropylbenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
4-Isopropyltoluene	—	<0.047	<0.047	<0.047	<0.050	<0.047
4-Methyl-2-pentanone	—	<0.47	<0.47	<0.47	<0.50	<0.47
Methylene chloride	0.0011	<0.14	<0.14	<0.14	<0.15	<0.14
n-Butylbenzene	—	<0.14	<0.14	<0.14	<0.15	<0.14
n-Propylbenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
sec-Butylbenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
Styrene	0.086	<0.047	<0.047	<0.047	<0.050	<0.047
tert-Butylbenzene	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,1,1,2-Tetrachloroethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,1,2,2-Tetrachloroethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
Tetrachloroethene (PCE)	0.0020	<0.047	<0.047	<0.047	<0.050	<0.047
trans-1,2-DCE	—	<0.047	<0.047	<0.047	<0.050	<0.047
trans-1,3-Dichloropropene	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,2,3-Trichlorobenzene	—	<0.094	<0.094	<0.093	<0.10	<0.095
1,2,4-Trichlorobenzene	0.15	<0.047	<0.047	<0.047	<0.050	<0.047
1,1,1-Trichloroethane	0.064	<0.047	<0.047	<0.047	<0.050	<0.047
1,1,2-Trichloroethane	0.0013	<0.047	<0.047	<0.047	<0.050	<0.047
Trichloroethene (TCE)	0.0016	<0.047	<0.047	<0.047	<0.050	<0.047
Trichlorofluoromethane	—	<0.047	<0.047	<0.047	<0.050	<0.047
1,2,3-Trichloropropane	—	<0.094	<0.094	<0.093	<0.10	<0.095
Vinyl chloride	0.0007	<0.047	<0.047	<0.047	<0.050	<0.047
Xylenes, Total	7.72	<0.094	<0.094	<0.093	<0.10	<0.095

[a] New Mexico groundwater soil screening level, DAF 1 (https://www.env.nm.gov/wp-content/uploads/2016/11/NMED_SSG_VOL-I_-March_2017_revised.pdf)
mg/kg = Milligrams per kilogram

Attachment 1

Site Plan



CDM Smith

City of Albuquerque Transit Department
Storm Water Pollution Prevention Plan (SWPPP)
ABQ Ride West Side Transit Facility (Daytona)

Figure No. 2A
Site Plan
September 2015

Attachment 2

Site Map

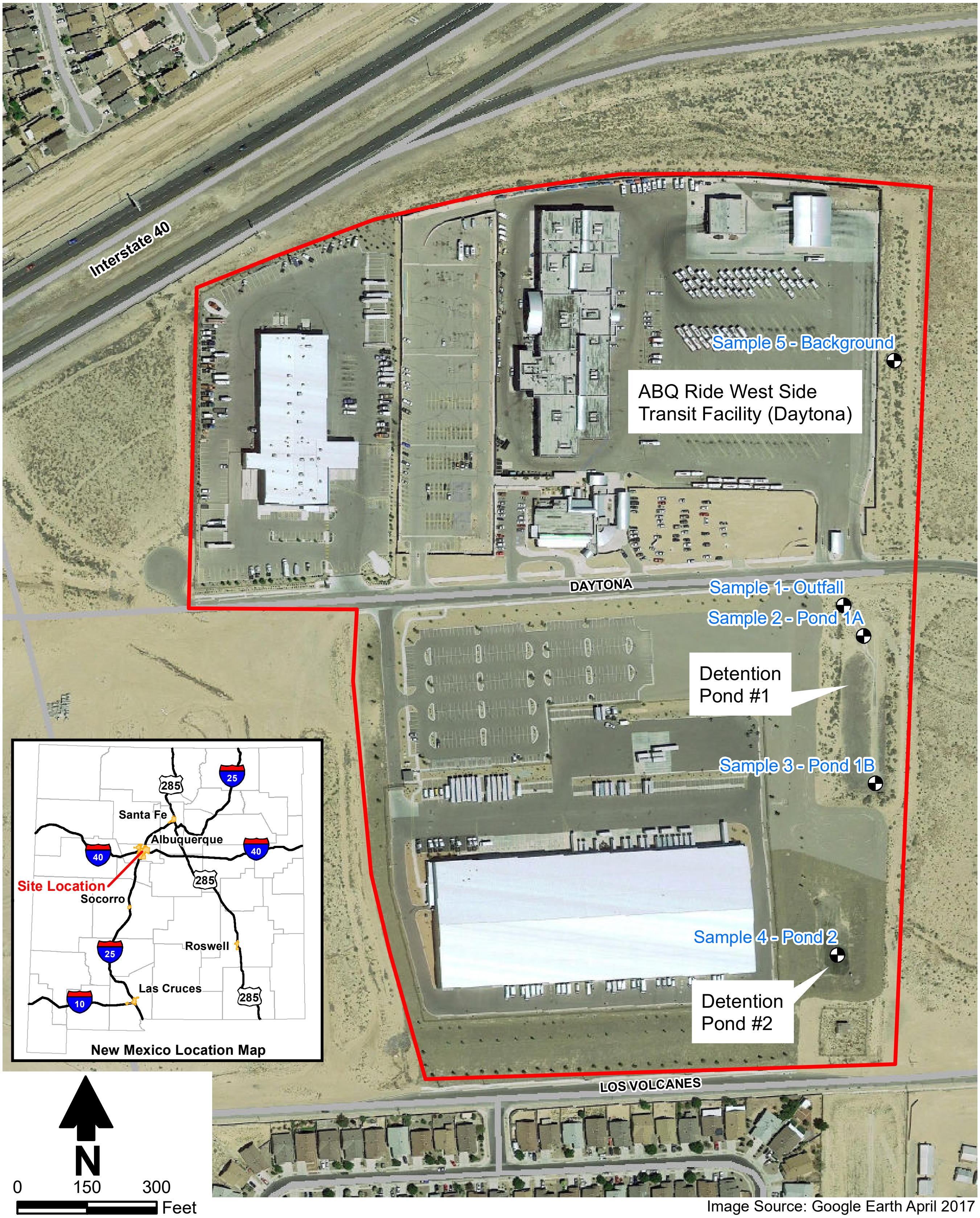


Image Source: Google Earth April 2017

Explanation

- Sediment sample location
- Site boundary

CITY OF ALBUQUERQUE

Daytona Illicit Discharge Investigation

Daniel B. Stephens & Associates, Inc.

4/20/2018

JN DB17.1158

Attachment 2

\\SS6ABQ\DATAS\PROJECTS\DB17.1158_CABQ_IDDE_PROGRAM\GIS\MXD\ATTACHMENT_2_SITE_MAP.MXD

Attachment 3

Field Notes

3/20/18

J. Kutz
E. Bastian

10:10 Onsite Daytona ABQ Ride West side Transit Facility. (I-40 and Unser)
Weather is sunny, dry, and ~ 45 ~~%~~ degrees F.

Task for today: collect soil samples, GPS coordinates and photographs of 5 locations set in the scope of work.

~~2~~ 6 - 8oz glass soil jars
~~12~~ 6 by - 4oz glass soil jars
@ Each location
Soil samples will be analyzed for the following:
1. RCRA - 8 metals (Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.
2. Additional metals (Molybdenum, copper, Aluminum and zinc).
3. DRO/GRO
4. VOCs
5. PAH - SIMS
6. chloride

3/20/18

J. Kutz
E. Bastien

10:50 Onsite @ Background location
GPS: wp 84 N: 35.08958 W: 106.73238
WGS 84
photos taken, sample collected as shown in scope map ~ 1/2 way up arroyo ~~on~~ east side of Transit facility. near 5th light Pole.
~~3 jars of~~ approximately 2 inches of cover material/soil removed.
11:15 3 jars filled completely full, no headspace
$\boxed{\text{11:15 Collect sample Background\_20180320}}$
Sample 3 jars (glass) set on ice
Trowell and spoon deconned with liquinox + DI and rinsed with DI.
11:30 @ ~~Outfall A location~~ Outfall location
GPS: WGS84 - N = 35.08812
waypt 85 W = 106.73273
Photos taken. outfall-20180320
$\boxed{\text{11:40 Sample collected}}$ ~~Pond 1A - 20180320~~
soil jars filled from ~~wet~~ moist soil near culvert outlet just at first concrete wall barrier.
Decon trowell + spoon with liquinox and DI, Rinsed w/ DI water.

3/20/18 J. Kutz
E. Bastien

11:50 @ Pond 1A ~~outfall~~ location
GPS: WGS 84 N: 35.08794
Wpt 86 W: 106.73259
Photos taken

12:00 collect sample Pond 1A_20180320
3 jars filled, soil collected from concrete lined chanel coming from culvert prior to 3 concrete lined ~~outfalls~~ conveyances ~70 ~~along~~ conveyance from outfall sample location. soil is light reddish brown
Dry soil collected 6 inches west of concrete conveyance.

12:15 @ Pond 1B Location
GPS: WGS84 waypt 87
N = 35.08707 W = 106.73248
Photos taken

12:20 collect Sample Pond 1B_20180320
3 jars filled, Dry soil.
ponded water at base of pond area and ~ 3 ft west of Pond 1B sample location.
Sample collected ~ 30 ft from southeast corner of pond area and ~ 40 ft from bend in concrete conveyance.

3/20/18 J. Kutz
E. Bastien

Soil @ Pond 1B is dark brown w/ some black spots mixed with light reddish brown soil
moist leaning wet, not saturated.
decon spoon + trowel w/ Liquinox + DI water

12:50 @ Pond 2
soil is wet, dark reddish brown some black streaks.
collected from ~ 30 ft of south end of pond and ~ middle East/west. the low pt of the pond.
GPS: WGS 84 N: 35.08605
W: 106.73273

13:00 collect sample Pond 2_20180320
filled 3 jars.
Removed ~ 2 inches of soil in a 1 x 1 ft square and filled soil in to 8 oz and 4 oz glass jars.
Photos taken

13:15 General site observations:
~~No obvious signs of contamination~~
No odors ~~detected~~ observed.
soil was dry from Background and Pond 1A
Soil from outfall, Pond 1B and pond 2 were moist to wet. Pond 2 was wet.

3/20/18

J. Kutz
E. Batiken

General observations continued:
ponded water in bond Pond
1 and 2.
Pond 1 pooled water 30x5' narrowing to 30x0.5'
Pond 2 pooled water 2x1 ft box
- staining observed on the concrete
conveyance from the outfall
to the south end of pond
1.
- soil sampling tools (Trowell
and spoon) were deconned
prior to each sample with
liquinox + DI water and
rinsed with DI water.
- Samples on Ice immediately
- Soil submitted to HALL
for analysis of table on previous pg.
- Top soil cover was removed
to ~ 2 inch depth. Sample
collected from ~ 2-5 inch
deep.
13:35 offsite

EB 3/20/18

Attachment 4

Photographs

1. Background sampling location, view toward the north

2. Background sampling location, view toward the south

3. Outfall sample location, view toward the northwest

4. Outfall sample location, view toward the southeast

5. Pond 1A sample location, view toward the northwest

6. Pond 1A sample location, view toward the southeast

7. Pond 1B, view toward the north

8. Pond 1A, view toward the south

9. Pond 2 sample location, view toward the northwest

10. Pond 2 sample location, view toward the northwest

Attachment 5

Laboratory Report

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

April 17, 2018

Chad Johannesen
Daniel B. Stephens & Assoc.
6020 Academy NE Suite 100
Albuquerque, NM 87109
TEL: (505) 822-9400
FAX (505) 822-8877

RE: ABQ Daytona OrderNo.: 1803B05

Dear Chad Johannesen:

Hall Environmental Analysis Laboratory received 5 sample(s) on 3/20/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1803B05**
Date Reported: **4/17/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Background_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 11:15:00 AM
Lab ID: 1803B05-001 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CJS**
Chloride	ND	30		mg/Kg	20	4/3/2018 1:41:50 PM	37403
EPA METHOD 7471: MERCURY						Analyst:	**rde**
Mercury	ND	0.033		mg/Kg	1	3/29/2018 4:04:33 PM	37324
EPA METHOD 6010B: SOIL METALS						Analyst:	**MED**
Aluminum	5700	300		mg/Kg	100	4/11/2018 11:20:10 AM	37343
Arsenic	ND	2.5		mg/Kg	1	4/13/2018 4:42:14 PM	37343
Barium	100	0.099		mg/Kg	1	4/9/2018 11:35:16 AM	37343
Cadmium	ND	0.099		mg/Kg	1	4/12/2018 8:50:08 PM	37343
Chromium	2.6	0.30		mg/Kg	1	4/9/2018 11:35:16 AM	37343
Copper	4.9	0.50		mg/Kg	1	4/12/2018 8:50:08 PM	37343
Lead	3.2	0.25		mg/Kg	1	4/13/2018 5:48:05 PM	37343
Molybdenum	ND	0.40		mg/Kg	1	4/9/2018 11:35:16 AM	37343
Selenium	ND	2.5		mg/Kg	1	4/12/2018 8:50:08 PM	37343
Silver	ND	0.25		mg/Kg	1	4/11/2018 12:08:44 PM	37343
Zinc	17	2.5		mg/Kg	1	4/9/2018 11:35:16 AM	37343
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/23/2018 3:31:39 PM	37160
Surr: DNOP	99.0	70-130		%Rec	1	3/23/2018 3:31:39 PM	37160
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/21/2018 6:36:16 PM	37123
Surr: BFB	95.2	15-316		%Rec	1	3/21/2018 6:36:16 PM	37123
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Naphthalene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
1-Methylnaphthalene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
2-Methylnaphthalene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Acenaphthylene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Acenaphthene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Fluorene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Phenanthrene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Anthracene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Fluoranthene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Pyrene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Benz(a)anthracene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Chrysene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Benzo(b)fluoranthene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Benzo(k)fluoranthene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Benzo(a)pyrene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Background_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 11:15:00 AM
Lab ID: 1803B05-001 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Dibenz(a,h)anthracene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Benzo(g,h,i)perylene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Indeno(1,2,3-cd)pyrene	ND	0.020		mg/Kg	1	3/27/2018 1:20:08 PM	37163
Surr: N-hexadecane	79.3	37.6-117		%Rec	1	3/27/2018 1:20:08 PM	37163
Surr: Benzo(e)pyrene	103	41.6-111		%Rec	1	3/27/2018 1:20:08 PM	37163
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Benzene	ND	0.023		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Toluene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Ethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Methyl tert-butyl ether (MTBE)	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2,4-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,3,5-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2-Dichloroethane (EDC)	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2-Dibromoethane (EDB)	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Naphthalene	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 11:20:24 AM	37123
2-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Acetone	ND	0.70		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Bromobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Bromodichloromethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Bromoform	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Bromomethane	ND	0.14		mg/Kg	1	4/2/2018 11:20:24 AM	37123
2-Butanone	ND	0.47		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Carbon disulfide	ND	0.47		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Carbon tetrachloride	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Chlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Chloroethane	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Chloroform	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Chloromethane	ND	0.14		mg/Kg	1	4/2/2018 11:20:24 AM	37123
2-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
4-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
cis-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
cis-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2-Dibromo-3-chloropropane	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Dibromochloromethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Dibromomethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,3-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,4-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Background_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 11:15:00 AM
Lab ID: 1803B05-001 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**
Dichlorodifluoromethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1-Dichloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1-Dichloroethene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,3-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
2,2-Dichloropropane	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1-Dichloropropene	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Hexachlorobutadiene	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
2-Hexanone	ND	0.47		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Isopropylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
4-Isopropyltoluene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
4-Methyl-2-pentanone	ND	0.47		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Methylene chloride	ND	0.14		mg/Kg	1	4/2/2018 11:20:24 AM	37123
n-Butylbenzene	ND	0.14		mg/Kg	1	4/2/2018 11:20:24 AM	37123
n-Propylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
sec-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Styrene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
tert-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1,1,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1,2,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Tetrachloroethene (PCE)	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
trans-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
trans-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2,3-Trichlorobenzene	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2,4-Trichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1,1-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,1,2-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Trichloroethene (TCE)	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Trichlorofluoromethane	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
1,2,3-Trichloropropane	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Vinyl chloride	ND	0.047		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Xylenes, Total	ND	0.094		mg/Kg	1	4/2/2018 11:20:24 AM	37123
Surr: Dibromofluoromethane	102	70-130		%Rec	1	4/2/2018 11:20:24 AM	37123
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	1	4/2/2018 11:20:24 AM	37123
Surr: Toluene-d8	96.7	70-130		%Rec	1	4/2/2018 11:20:24 AM	37123
Surr: 4-Bromofluorobenzene	114	70-130		%Rec	1	4/2/2018 11:20:24 AM	37123

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **4/17/2018**

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Outfall_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 11:40:00 AM
Lab ID: 1803B05-002 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CJS**
Chloride	ND	30		mg/Kg	20	4/3/2018 1:54:14 PM	37403
EPA METHOD 7471: MERCURY						Analyst:	**rde**
Mercury	ND	0.031		mg/Kg	1	3/29/2018 4:06:16 PM	37324
EPA METHOD 6010B: SOIL METALS						Analyst:	**MED**
Aluminum	2800	58		mg/Kg	20	4/11/2018 11:21:36 AM	37343
Arsenic	ND	2.4		mg/Kg	1	4/13/2018 4:43:49 PM	37343
Barium	75	0.097		mg/Kg	1	4/9/2018 11:43:37 AM	37343
Cadmium	ND	0.097		mg/Kg	1	4/12/2018 8:51:39 PM	37343
Chromium	4.2	0.29		mg/Kg	1	4/9/2018 11:43:37 AM	37343
Copper	8.2	0.48		mg/Kg	1	4/12/2018 8:51:39 PM	37343
Lead	3.1	0.24		mg/Kg	1	4/13/2018 5:49:41 PM	37343
Molybdenum	ND	0.39		mg/Kg	1	4/9/2018 11:43:37 AM	37343
Selenium	ND	2.4		mg/Kg	1	4/12/2018 8:51:39 PM	37343
Silver	ND	0.24		mg/Kg	1	4/11/2018 12:10:26 PM	37343
Zinc	23	2.4		mg/Kg	1	4/9/2018 11:43:37 AM	37343
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	3/26/2018 12:28:38 PM	37160
Surr: DNOP	91.8	70-130		%Rec	1	3/26/2018 12:28:38 PM	37160
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/21/2018 6:59:52 PM	37123
Surr: BFB	94.7	15-316		%Rec	1	3/21/2018 6:59:52 PM	37123
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Naphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
1-Methylnaphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
2-Methylnaphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Acenaphthylene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Acenaphthene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Fluorene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Phenanthrene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Benz(a)anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Chrysene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Benzo(b)fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Benzo(k)fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Benzo(a)pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **4/17/2018**

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Outfall_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 11:40:00 AM
Lab ID: 1803B05-002 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Dibenz(a,h)anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Benzo(g,h,i)perylene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Indeno(1,2,3-cd)pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 2:32:41 PM	37163
Surr: N-hexadecane	0	37.6-117	SD	%Rec	10	3/27/2018 2:32:41 PM	37163
Surr: Benzo(e)pyrene	0	41.6-111	SD	%Rec	10	3/27/2018 2:32:41 PM	37163
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Benzene	ND	0.023		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Toluene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Ethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Methyl tert-butyl ether (MTBE)	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2,4-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,3,5-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2-Dichloroethane (EDC)	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2-Dibromoethane (EDB)	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Naphthalene	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 11:49:32 AM	37123
2-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Acetone	ND	0.70		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Bromobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Bromodichloromethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Bromoform	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Bromomethane	ND	0.14		mg/Kg	1	4/2/2018 11:49:32 AM	37123
2-Butanone	ND	0.47		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Carbon disulfide	ND	0.47		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Carbon tetrachloride	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Chlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Chloroethane	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Chloroform	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Chloromethane	ND	0.14		mg/Kg	1	4/2/2018 11:49:32 AM	37123
2-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
4-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
cis-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
cis-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2-Dibromo-3-chloropropane	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Dibromochloromethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Dibromomethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,3-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,4-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Outfall_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 11:40:00 AM
Lab ID: 1803B05-002 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Dichlorodifluoromethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1-Dichloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1-Dichloroethene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,3-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
2,2-Dichloropropane	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1-Dichloropropene	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Hexachlorobutadiene	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
2-Hexanone	ND	0.47		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Isopropylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
4-Isopropyltoluene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
4-Methyl-2-pentanone	ND	0.47		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Methylene chloride	ND	0.14		mg/Kg	1	4/2/2018 11:49:32 AM	37123
n-Butylbenzene	ND	0.14		mg/Kg	1	4/2/2018 11:49:32 AM	37123
n-Propylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
sec-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Styrene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
tert-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1,1,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1,2,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Tetrachloroethene (PCE)	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
trans-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
trans-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2,3-Trichlorobenzene	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2,4-Trichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1,1-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,1,2-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Trichloroethene (TCE)	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Trichlorofluoromethane	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
1,2,3-Trichloropropane	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Vinyl chloride	ND	0.047		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Xylenes, Total	ND	0.094		mg/Kg	1	4/2/2018 11:49:32 AM	37123
Surr: Dibromofluoromethane	103	70-130		%Rec	1	4/2/2018 11:49:32 AM	37123
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	4/2/2018 11:49:32 AM	37123
Surr: Toluene-d8	96.9	70-130		%Rec	1	4/2/2018 11:49:32 AM	37123
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	4/2/2018 11:49:32 AM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond1A_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 12:00:00 PM
Lab ID: 1803B05-003 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CJS**
Chloride	ND	30		mg/Kg	20	4/3/2018 2:56:17 PM	37403
EPA METHOD 7471: MERCURY						Analyst:	**rde**
Mercury	ND	0.032		mg/Kg	1	3/29/2018 4:08:00 PM	37324
EPA METHOD 6010B: SOIL METALS						Analyst:	**MED**
Aluminum	5400	290		mg/Kg	100	4/11/2018 11:23:03 AM	37343
Arsenic	ND	2.4		mg/Kg	1	4/13/2018 4:45:27 PM	37343
Barium	80	0.097		mg/Kg	1	4/9/2018 11:45:16 AM	37343
Cadmium	ND	0.097		mg/Kg	1	4/12/2018 8:53:09 PM	37343
Chromium	3.8	0.29		mg/Kg	1	4/9/2018 11:45:16 AM	37343
Copper	4.0	0.48		mg/Kg	1	4/12/2018 8:53:09 PM	37343
Lead	2.9	0.24		mg/Kg	1	4/13/2018 5:51:16 PM	37343
Molybdenum	ND	0.39		mg/Kg	1	4/9/2018 11:45:16 AM	37343
Selenium	ND	2.4		mg/Kg	1	4/12/2018 8:53:09 PM	37343
Silver	ND	0.24		mg/Kg	1	4/11/2018 12:12:04 PM	37343
Zinc	21	2.4		mg/Kg	1	4/9/2018 11:45:16 AM	37343
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/23/2018 5:21:37 PM	37160
Surr: DNOP	84.4	70-130		%Rec	1	3/23/2018 5:21:37 PM	37160
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/21/2018 7:23:21 PM	37123
Surr: BFB	98.8	15-316		%Rec	1	3/21/2018 7:23:21 PM	37123
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Naphthalene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
1-Methylnaphthalene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
2-Methylnaphthalene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Acenaphthylene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Acenaphthene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Fluorene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Phenanthrene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Anthracene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Fluoranthene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Pyrene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Benz(a)anthracene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Chrysene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Benzo(b)fluoranthene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Benzo(k)fluoranthene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Benzo(a)pyrene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **4/17/2018**

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond1A_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 12:00:00 PM
Lab ID: 1803B05-003 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Dibenz(a,h)anthracene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Benzo(g,h,i)perylene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Indeno(1,2,3-cd)pyrene	ND	0.19	D	mg/Kg	10	3/27/2018 2:56:53 PM	37163
Surr: N-hexadecane	0	37.6-117	SD	%Rec	10	3/27/2018 2:56:53 PM	37163
Surr: Benzo(e)pyrene	0	41.6-111	SD	%Rec	10	3/27/2018 2:56:53 PM	37163
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Benzene	ND	0.023		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Toluene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Ethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Methyl tert-butyl ether (MTBE)	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2,4-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,3,5-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2-Dichloroethane (EDC)	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2-Dibromoethane (EDB)	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Naphthalene	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 12:19:07 PM	37123
2-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Acetone	ND	0.70		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Bromobenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Bromodichloromethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Bromoform	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Bromomethane	ND	0.14		mg/Kg	1	4/2/2018 12:19:07 PM	37123
2-Butanone	ND	0.47		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Carbon disulfide	ND	0.47		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Carbon tetrachloride	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Chlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Chloroethane	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Chloroform	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Chloromethane	ND	0.14		mg/Kg	1	4/2/2018 12:19:07 PM	37123
2-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
4-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
cis-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
cis-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2-Dibromo-3-chloropropane	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Dibromochloromethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Dibromomethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,3-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,4-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond1A_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 12:00:00 PM
Lab ID: 1803B05-003 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Dichlorodifluoromethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1-Dichloroethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1-Dichloroethene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,3-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
2,2-Dichloropropane	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1-Dichloropropene	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Hexachlorobutadiene	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
2-Hexanone	ND	0.47		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Isopropylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
4-Isopropyltoluene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
4-Methyl-2-pentanone	ND	0.47		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Methylene chloride	ND	0.14		mg/Kg	1	4/2/2018 12:19:07 PM	37123
n-Butylbenzene	ND	0.14		mg/Kg	1	4/2/2018 12:19:07 PM	37123
n-Propylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
sec-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Styrene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
tert-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1,1,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1,2,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Tetrachloroethene (PCE)	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
trans-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
trans-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2,3-Trichlorobenzene	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2,4-Trichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1,1-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,1,2-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Trichloroethene (TCE)	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Trichlorofluoromethane	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
1,2,3-Trichloropropane	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Vinyl chloride	ND	0.047		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Xylenes, Total	ND	0.093		mg/Kg	1	4/2/2018 12:19:07 PM	37123
Surr: Dibromofluoromethane	104	70-130		%Rec	1	4/2/2018 12:19:07 PM	37123
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	4/2/2018 12:19:07 PM	37123
Surr: Toluene-d8	97.4	70-130		%Rec	1	4/2/2018 12:19:07 PM	37123
Surr: 4-Bromofluorobenzene	114	70-130		%Rec	1	4/2/2018 12:19:07 PM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond1B_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 12:20:00 PM
Lab ID: 1803B05-004 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CJS**
Chloride	ND	30		mg/Kg	20	4/3/2018 3:08:41 PM	37403
EPA METHOD 7471: MERCURY						Analyst:	**rde**
Mercury	ND	0.033		mg/Kg	1	3/29/2018 4:09:44 PM	37324
EPA METHOD 6010B: SOIL METALS						Analyst:	**MED**
Aluminum	7800	300		mg/Kg	100	4/11/2018 11:24:31 AM	37343
Arsenic	ND	2.5		mg/Kg	1	4/13/2018 4:47:02 PM	37343
Barium	140	0.099		mg/Kg	1	4/9/2018 11:46:56 AM	37343
Cadmium	ND	0.099		mg/Kg	1	4/12/2018 8:54:39 PM	37343
Chromium	6.8	0.30		mg/Kg	1	4/9/2018 11:46:56 AM	37343
Copper	32	0.50		mg/Kg	1	4/12/2018 8:54:39 PM	37343
Lead	8.6	0.25		mg/Kg	1	4/13/2018 5:52:52 PM	37343
Molybdenum	ND	0.40		mg/Kg	1	4/9/2018 11:46:56 AM	37343
Selenium	ND	2.5		mg/Kg	1	4/12/2018 8:54:39 PM	37343
Silver	ND	0.25		mg/Kg	1	4/11/2018 12:21:31 PM	37343
Zinc	69	2.5		mg/Kg	1	4/9/2018 11:46:56 AM	37343
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	100	96		mg/Kg	10	3/23/2018 6:16:28 PM	37160
Surr: DNOP	0	70-130	S	%Rec	10	3/23/2018 6:16:28 PM	37160
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/21/2018 7:46:51 PM	37123
Surr: BFB	94.9	15-316		%Rec	1	3/21/2018 7:46:51 PM	37123
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Naphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
1-Methylnaphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
2-Methylnaphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Acenaphthylene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Acenaphthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Fluorene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Phenanthrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Benz(a)anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Chrysene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Benzo(b)fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Benzo(k)fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Benzo(a)pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc.
Project: ABQ Daytona
Lab ID: 1803B05-004 **Matrix:** SOIL

Client Sample ID: Pond1B_20180320
Collection Date: 3/20/2018 12:20:00 PM
Received Date: 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Dibenz(a,h)anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Benzo(g,h,i)perylene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Indeno(1,2,3-cd)pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:21:03 PM	37163
Surr: N-hexadecane	0	37.6-117	SD	%Rec	10	3/27/2018 3:21:03 PM	37163
Surr: Benzo(e)pyrene	0	41.6-111	SD	%Rec	10	3/27/2018 3:21:03 PM	37163
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Benzene	ND	0.025		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Toluene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Ethylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Methyl tert-butyl ether (MTBE)	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2,4-Trimethylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,3,5-Trimethylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2-Dichloroethane (EDC)	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2-Dibromoethane (EDB)	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Naphthalene	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1-Methylnaphthalene	ND	0.20		mg/Kg	1	4/2/2018 12:48:56 PM	37123
2-Methylnaphthalene	ND	0.20		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Acetone	ND	0.75		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Bromobenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Bromodichloromethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Bromoform	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Bromomethane	ND	0.15		mg/Kg	1	4/2/2018 12:48:56 PM	37123
2-Butanone	ND	0.50		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Carbon disulfide	ND	0.50		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Carbon tetrachloride	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Chlorobenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Chloroethane	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Chloroform	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Chloromethane	ND	0.15		mg/Kg	1	4/2/2018 12:48:56 PM	37123
2-Chlorotoluene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
4-Chlorotoluene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
cis-1,2-DCE	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
cis-1,3-Dichloropropene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2-Dibromo-3-chloropropane	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Dibromochloromethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Dibromomethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2-Dichlorobenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,3-Dichlorobenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,4-Dichlorobenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond1B_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 12:20:00 PM
Lab ID: 1803B05-004 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**
Dichlorodifluoromethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1-Dichloroethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1-Dichloroethene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2-Dichloropropane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,3-Dichloropropane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
2,2-Dichloropropane	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1-Dichloropropene	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Hexachlorobutadiene	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
2-Hexanone	ND	0.50		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Isopropylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
4-Isopropyltoluene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
4-Methyl-2-pentanone	ND	0.50		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Methylene chloride	ND	0.15		mg/Kg	1	4/2/2018 12:48:56 PM	37123
n-Butylbenzene	ND	0.15		mg/Kg	1	4/2/2018 12:48:56 PM	37123
n-Propylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
sec-Butylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Styrene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
tert-Butylbenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1,1,2-Tetrachloroethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1,2,2-Tetrachloroethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Tetrachloroethene (PCE)	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
trans-1,2-DCE	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
trans-1,3-Dichloropropene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2,3-Trichlorobenzene	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2,4-Trichlorobenzene	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1,1-Trichloroethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,1,2-Trichloroethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Trichloroethene (TCE)	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Trichlorofluoromethane	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
1,2,3-Trichloropropane	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Vinyl chloride	ND	0.050		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Xylenes, Total	ND	0.10		mg/Kg	1	4/2/2018 12:48:56 PM	37123
Surr: Dibromofluoromethane	105	70-130		%Rec	1	4/2/2018 12:48:56 PM	37123
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	4/2/2018 12:48:56 PM	37123
Surr: Toluene-d8	95.5	70-130		%Rec	1	4/2/2018 12:48:56 PM	37123
Surr: 4-Bromofluorobenzene	114	70-130		%Rec	1	4/2/2018 12:48:56 PM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Analytical Report
Lab Order **1803B05**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **4/17/2018**

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond2_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 1:00:00 PM
Lab ID: 1803B05-005 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: **CJS**
Chloride	ND	30		mg/Kg	20	4/3/2018 3:21:05 PM	37403
EPA METHOD 7471: MERCURY							Analyst: **rde**
Mercury	ND	0.032		mg/Kg	1	3/29/2018 4:11:29 PM	37324
EPA METHOD 6010B: SOIL METALS							Analyst: **MED**
Aluminum	8200	300		mg/Kg	100	4/11/2018 11:25:58 AM	37343
Arsenic	ND	2.5		mg/Kg	1	4/13/2018 4:57:39 PM	37343
Barium	94	0.10		mg/Kg	1	4/9/2018 11:48:35 AM	37343
Cadmium	ND	0.10		mg/Kg	1	4/12/2018 9:02:50 PM	37343
Chromium	5.6	0.30		mg/Kg	1	4/9/2018 11:48:35 AM	37343
Copper	6.2	0.50		mg/Kg	1	4/12/2018 9:02:50 PM	37343
Lead	3.1	0.25		mg/Kg	1	4/13/2018 5:54:26 PM	37343
Molybdenum	ND	0.40		mg/Kg	1	4/9/2018 11:48:35 AM	37343
Selenium	ND	2.5		mg/Kg	1	4/13/2018 5:54:26 PM	37343
Silver	ND	0.25		mg/Kg	1	4/11/2018 12:23:15 PM	37343
Zinc	45	2.5		mg/Kg	1	4/9/2018 11:48:35 AM	37343
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	3/26/2018 12:56:10 PM	37160
Surr: DNOP	97.5	70-130		%Rec	1	3/26/2018 12:56:10 PM	37160
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/21/2018 8:34:06 PM	37123
Surr: BFB	95.6	15-316		%Rec	1	3/21/2018 8:34:06 PM	37123
EPA METHOD 8270C: PAHS							Analyst: **DAM**
Naphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
1-Methylnaphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
2-Methylnaphthalene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Acenaphthylene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Acenaphthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Fluorene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Phenanthrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Benz(a)anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Chrysene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Benzo(b)fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Benzo(k)fluoranthene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Benzo(a)pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond2_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 1:00:00 PM
Lab ID: 1803B05-005 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst:	**DAM**
Dibenz(a,h)anthracene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Benzo(g,h,i)perylene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Indeno(1,2,3-cd)pyrene	ND	0.20	D	mg/Kg	10	3/27/2018 3:45:15 PM	37163
Surr: N-hexadecane	0	37.6-117	SD	%Rec	10	3/27/2018 3:45:15 PM	37163
Surr: Benzo(e)pyrene	0	41.6-111	SD	%Rec	10	3/27/2018 3:45:15 PM	37163
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Benzene	ND	0.024		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Toluene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Ethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Methyl tert-butyl ether (MTBE)	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2,4-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,3,5-Trimethylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2-Dichloroethane (EDC)	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2-Dibromoethane (EDB)	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Naphthalene	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 1:18:10 PM	37123
2-Methylnaphthalene	ND	0.19		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Acetone	ND	0.71		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Bromobenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Bromodichloromethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Bromoform	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Bromomethane	ND	0.14		mg/Kg	1	4/2/2018 1:18:10 PM	37123
2-Butanone	ND	0.47		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Carbon disulfide	ND	0.47		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Carbon tetrachloride	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Chlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Chloroethane	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Chloroform	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Chloromethane	ND	0.14		mg/Kg	1	4/2/2018 1:18:10 PM	37123
2-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
4-Chlorotoluene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
cis-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
cis-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2-Dibromo-3-chloropropane	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Dibromochloromethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Dibromomethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,3-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,4-Dichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Daniel B. Stephens & Assoc. **Client Sample ID:** Pond2_20180320
Project: ABQ Daytona **Collection Date:** 3/20/2018 1:00:00 PM
Lab ID: 1803B05-005 **Matrix:** SOIL **Received Date:** 3/20/2018 2:10:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst:	**DJF**
Dichlorodifluoromethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1-Dichloroethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1-Dichloroethene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,3-Dichloropropane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
2,2-Dichloropropane	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1-Dichloropropene	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Hexachlorobutadiene	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
2-Hexanone	ND	0.47		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Isopropylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
4-Isopropyltoluene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
4-Methyl-2-pentanone	ND	0.47		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Methylene chloride	ND	0.14		mg/Kg	1	4/2/2018 1:18:10 PM	37123
n-Butylbenzene	ND	0.14		mg/Kg	1	4/2/2018 1:18:10 PM	37123
n-Propylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
sec-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Styrene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
tert-Butylbenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1,1,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1,2,2-Tetrachloroethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Tetrachloroethene (PCE)	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
trans-1,2-DCE	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
trans-1,3-Dichloropropene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2,3-Trichlorobenzene	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2,4-Trichlorobenzene	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1,1-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,1,2-Trichloroethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Trichloroethene (TCE)	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Trichlorofluoromethane	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
1,2,3-Trichloropropane	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Vinyl chloride	ND	0.047		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Xylenes, Total	ND	0.095		mg/Kg	1	4/2/2018 1:18:10 PM	37123
Surr: Dibromofluoromethane	107	70-130		%Rec	1	4/2/2018 1:18:10 PM	37123
Surr: 1,2-Dichloroethane-d4	111	70-130		%Rec	1	4/2/2018 1:18:10 PM	37123
Surr: Toluene-d8	96.7	70-130		%Rec	1	4/2/2018 1:18:10 PM	37123
Surr: 4-Bromofluorobenzene	115	70-130		%Rec	1	4/2/2018 1:18:10 PM	37123

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1803B05**

Hall Environmental Analysis Laboratory, Inc.

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID	**MB-37403**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**						
Client ID:	**PBS**	Batch ID:	**37403**	RunNo:	**50279**						
Prep Date:	**4/3/2018**	Analysis Date:	**4/3/2018**	SeqNo:	**1629258**	Units:	**mg/Kg**				

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-37403**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**		
Client ID:	**LCSS**	Batch ID:	**37403**	RunNo:	**50279**		
Prep Date:	**4/3/2018**	Analysis Date:	**4/3/2018**	SeqNo:	**1629259**	Units:	**mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1803B05**

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **LCS-37160** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **37160** RunNo: **49989**

Prep Date: **3/21/2018** Analysis Date: **3/22/2018** SeqNo: **1618801** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	10	50.00	0	78.3	70	130			
Surr: DNOP	4.2		5.000		84.7	70	130			

Sample ID **MB-37160** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **37160** RunNo: **49989**

Prep Date: **3/21/2018** Analysis Date: **3/22/2018** SeqNo: **1618802** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Surr: DNOP	9.2		10.00		92.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1803B05**

Hall Environmental Analysis Laboratory, Inc.

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **MB-37123**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **37123**	RunNo: **49962**
Prep Date: **3/20/2018**	Analysis Date: **3/21/2018**	SeqNo: **1618141** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		94.1	15	316			

Sample ID **LCS-37123**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **37123**	RunNo: **49962**
Prep Date: **3/20/2018**	Analysis Date: **3/21/2018**	SeqNo: **1618142** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	75.9	131			
Surr: BFB	1000		1000		105	15	316			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1803B05**

Hall Environmental Analysis Laboratory, Inc.

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **mb-37123** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles**

Client ID: **PBS** Batch ID: **37123** RunNo: **49981**

Prep Date: **3/20/2018** Analysis Date: **3/21/2018** SeqNo: **1618267** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	ND	0.15								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	ND	0.15								
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1803B05**
17-Apr-18

Client: Daniel B. Stephens & Assoc.
Project: ABQ Daytona

Sample ID mb-37123	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles
Client ID: PBS	Batch ID: 37123	RunNo: 49981
Prep Date: 3/20/2018	Analysis Date: 3/21/2018	SeqNo: 1618267 Units: mg/Kg

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.57		0.5000		115	70	130			
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		102	70	130			
Surr: Toluene-d8	0.51		0.5000		102	70	130			
Surr: 4-Bromofluorobenzene	0.57		0.5000		114	70	130			

Sample ID lcs-37123	SampType: LCS	TestCode: EPA Method 8260B: Volatiles
Client ID: LCSS	Batch ID: 37123	RunNo: 49981
Prep Date: 3/20/2018	Analysis Date: 3/21/2018	SeqNo: 1618268 Units: mg/Kg

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	104	70	130			
Toluene	1.0	0.050	1.000	0	103	70	130			
Chlorobenzene	1.1	0.050	1.000	0	108	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1803B05**

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **lcs-37123** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**

Client ID: **LCSS** Batch ID: **37123** RunNo: **49981**

Prep Date: **3/20/2018** Analysis Date: **3/21/2018** SeqNo: **1618268** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	1.4	0.050	1.000	0	137	70	130			S
Trichloroethene (TCE)	1.0	0.050	1.000	0	104	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		110	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.6	70	130			
Surr: Toluene-d8	0.50		0.5000		99.4	70	130			
Surr: 4-Bromofluorobenzene	0.56		0.5000		113	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1803B05**

Hall Environmental Analysis Laboratory, Inc.

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **1803b05-001ams** SampType: **MS** TestCode: **EPA Method 8270C: PAHs**

Client ID: **Background_20180** Batch ID: **37163** RunNo: **50115**

Prep Date: **3/21/2018** Analysis Date: **3/27/2018** SeqNo: **1622876** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.18	0.019	0.3203	0	56.6	40.7	116			
1-Methylnaphthalene	0.21	0.019	0.3203	0	67.0	30.1	114			
2-Methylnaphthalene	0.21	0.019	0.3203	0	66.0	43.5	114			
Acenaphthylene	0.22	0.019	0.3203	0	67.7	34.3	126			
Acenaphthene	0.24	0.019	0.3203	0	76.4	28.7	137			
Fluorene	0.27	0.019	0.3203	0	84.8	32.5	134			
Phenanthrene	0.26	0.019	0.3203	0	79.9	51.4	117			
Anthracene	0.24	0.019	0.3203	0	76.3	47.3	116			
Fluoranthene	0.29	0.019	0.3203	0	91.7	57.3	116			
Pyrene	0.29	0.019	0.3203	0	89.5	48.9	124			
Benz(a)anthracene	0.29	0.019	0.3203	0	91.5	52.2	125			
Chrysene	0.27	0.019	0.3203	0	85.6	36.6	134			
Benzo(b)fluoranthene	0.34	0.019	0.3203	0	106	32.7	146			
Benzo(k)fluoranthene	0.32	0.019	0.3203	0	101	39.6	135			
Benzo(a)pyrene	0.30	0.019	0.3203	0	92.3	41.8	125			
Dibenz(a,h)anthracene	0.30	0.019	0.3203	0	93.6	43.4	130			
Benzo(g,h,i)perylene	0.29	0.019	0.3203	0	90.3	39.2	130			
Indeno(1,2,3-cd)pyrene	0.30	0.019	0.3203	0	92.1	42.6	133			
Surr: N-hexadecane	1.4		1.417		99.1	37.6	117			
Surr: Benzo(e)pyrene	0.34		0.3203		107	41.6	111			

Sample ID **1803b05-001amsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**

Client ID: **Background_20180** Batch ID: **37163** RunNo: **50115**

Prep Date: **3/21/2018** Analysis Date: **3/27/2018** SeqNo: **1622877** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.12	0.020	0.3275	0	36.5	40.7	116	41.1	62.2	S
1-Methylnaphthalene	0.13	0.020	0.3275	0	40.3	30.1	114	47.6	30.4	R
2-Methylnaphthalene	0.13	0.020	0.3275	0	39.8	43.5	114	47.4	36.6	RS
Acenaphthylene	0.14	0.020	0.3275	0	43.5	34.3	126	41.3	35	R
Acenaphthene	0.16	0.020	0.3275	0	47.9	28.7	137	43.7	33.1	R
Fluorene	0.18	0.020	0.3275	0	55.1	32.5	134	40.5	38.7	R
Phenanthrene	0.19	0.020	0.3275	0	59.1	51.4	117	27.8	24.7	R
Anthracene	0.19	0.020	0.3275	0	57.6	47.3	116	25.7	38.6	
Fluoranthene	0.22	0.020	0.3275	0	67.7	57.3	116	28.0	26.3	R
Pyrene	0.21	0.020	0.3275	0	64.6	48.9	124	30.1	41.4	
Benz(a)anthracene	0.22	0.020	0.3275	0	65.7	52.2	125	30.7	34.7	
Chrysene	0.19	0.020	0.3275	0	59.0	36.6	134	34.6	32	R
Benzo(b)fluoranthene	0.23	0.020	0.3275	0	71.7	32.7	146	36.4	41.1	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1803B05**

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **1803b05-001amsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**

Client ID: **Background_20180** Batch ID: **37163** RunNo: **50115**

Prep Date: **3/21/2018** Analysis Date: **3/27/2018** SeqNo: **1622877** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	0.23	0.020	0.3275	0	69.3	39.6	135	35.5	32.7	R
Benzo(a)pyrene	0.21	0.020	0.3275	0	65.6	41.8	125	31.7	40	
Dibenz(a,h)anthracene	0.22	0.020	0.3275	0	66.1	43.4	130	32.4	38	
Benzo(g,h,i)perylene	0.19	0.020	0.3275	0	59.5	39.2	130	39.0	35	R
Indeno(1,2,3-cd)pyrene	0.20	0.020	0.3275	0	61.1	42.6	133	38.3	31.2	R
Surr: N-hexadecane	0.83		1.449		57.5	37.6	117	0	0	
Surr: Benzo(e)pyrene	0.22		0.3275		68.1	41.6	111	0	0	

Sample ID **mb-37163** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**

Client ID: **PBS** Batch ID: **37163** RunNo: **50115**

Prep Date: **3/21/2018** Analysis Date: **3/27/2018** SeqNo: **1622883** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.020								
1-Methylnaphthalene	ND	0.020								
2-Methylnaphthalene	ND	0.020								
Acenaphthylene	ND	0.020								
Acenaphthene	ND	0.020								
Fluorene	ND	0.020								
Phenanthrene	ND	0.020								
Anthracene	ND	0.020								
Fluoranthene	ND	0.020								
Pyrene	ND	0.020								
Benz(a)anthracene	ND	0.020								
Chrysene	ND	0.020								
Benzo(b)fluoranthene	ND	0.020								
Benzo(k)fluoranthene	ND	0.020								
Benzo(a)pyrene	ND	0.020								
Dibenz(a,h)anthracene	ND	0.020								
Benzo(g,h,i)perylene	ND	0.020								
Indeno(1,2,3-cd)pyrene	ND	0.020								
Surr: N-hexadecane	1.2		1.460		81.9	37.6	117			
Surr: Benzo(e)pyrene	0.29		0.3300		88.5	41.6	111			

Sample ID **lcs-37163** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**

Client ID: **LCSS** Batch ID: **37163** RunNo: **50184**

Prep Date: **3/21/2018** Analysis Date: **3/29/2018** SeqNo: **1625688** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.17	0.020	0.3300	0	51.3	45.6	106			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1803B05**

Hall Environmental Analysis Laboratory, Inc.

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **lcs-37163** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**

Client ID: **LCSS** Batch ID: **37163** RunNo: **50184**

Prep Date: **3/21/2018** Analysis Date: **3/29/2018** SeqNo: **1625688** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	0.18	0.020	0.3300	0	54.5	41.2	105			
2-Methylnaphthalene	0.18	0.020	0.3300	0	53.0	46.1	106			
Acenaphthylene	0.19	0.020	0.3300	0	56.6	42.3	118			
Acenaphthene	0.20	0.020	0.3300	0	59.2	41.1	125			
Fluorene	0.21	0.020	0.3300	0	64.2	46.4	121			
Phenanthrene	0.25	0.020	0.3300	0	75.3	51.6	110			
Anthracene	0.24	0.020	0.3300	0	72.8	48.4	106			
Fluoranthene	0.28	0.020	0.3300	0	85.3	52.5	118			
Pyrene	0.26	0.020	0.3300	0	79.8	48.9	120			
Benz(a)anthracene	0.26	0.020	0.3300	0	79.3	50	121			
Chrysene	0.25	0.020	0.3300	0	75.8	42.8	117			
Benzo(b)fluoranthene	0.30	0.020	0.3300	0	90.0	41.8	133			
Benzo(k)fluoranthene	0.29	0.020	0.3300	0	87.1	45.1	125			
Benzo(a)pyrene	0.26	0.020	0.3300	0	79.3	44.8	116			
Dibenz(a,h)anthracene	0.26	0.020	0.3300	0	80.2	49.8	121			
Benzo(g,h,i)perylene	0.27	0.020	0.3300	0	81.4	49	118			
Indeno(1,2,3-cd)pyrene	0.28	0.020	0.3300	0	86.0	48	119			
Surr: N-hexadecane	0.97		1.460		66.7	37.6	117			
Surr: Benzo(e)pyrene	0.29		0.3300		87.3	41.6	111			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1803B05**

Hall Environmental Analysis Laboratory, Inc.

17-Apr-18

Client: Daniel B. Stephens & Assoc.
Project: ABQ Daytona

Sample ID **MB-37324** SampType: **MBLK** TestCode: **EPA Method 7471: Mercury**
Client ID: **PBS** Batch ID: **37324** RunNo: **50188**
Prep Date: **3/29/2018** Analysis Date: **3/29/2018** SeqNo: **1625317** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID **LCS-37324** SampType: **LCS** TestCode: **EPA Method 7471: Mercury**
Client ID: **LCSS** Batch ID: **37324** RunNo: **50188**
Prep Date: **3/29/2018** Analysis Date: **3/29/2018** SeqNo: **1625318** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.18	0.033	0.1667	0	107	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1803B05**

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **MB-37343**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **37343**	RunNo: **50398**
Prep Date: **3/30/2018**	Analysis Date: **4/9/2018**	SeqNo: **1633693** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	3.0								
Barium	ND	0.10								
Chromium	ND	0.30								
Molybdenum	ND	0.40								

Sample ID **LCS-37343**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **37343**	RunNo: **50398**
Prep Date: **3/30/2018**	Analysis Date: **4/9/2018**	SeqNo: **1633694** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	27	3.0	25.00	0	108	80	120			
Barium	24	0.10	25.00	0	94.6	80	120			
Chromium	25	0.30	25.00	0	99.7	80	120			
Molybdenum	25	0.40	25.00	0	101	80	120			

Sample ID **MB-37343**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **37343**	RunNo: **50466**
Prep Date: **3/30/2018**	Analysis Date: **4/11/2018**	SeqNo: **1636544** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.10								
Cadmium	ND	0.10								
Silver	ND	0.25								

Sample ID **LCS-37343**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **37343**	RunNo: **50466**
Prep Date: **3/30/2018**	Analysis Date: **4/11/2018**	SeqNo: **1636545** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	24	0.10	25.00	0	95.7	80	120			
Cadmium	24	0.10	25.00	0	95.3	80	120			
Silver	4.7	0.25	5.000	0	94.6	80	120			

Sample ID **MB-37343**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **37343**	RunNo: **50524**
Prep Date: **3/30/2018**	Analysis Date: **4/12/2018**	SeqNo: **1638532** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Copper	1.0	0.30								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1803B05**

17-Apr-18

Client: Daniel B. Stephens & Assoc.

Project: ABQ Daytona

Sample ID **MB-37343** SampType: **MBLK** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **PBS** Batch ID: **37343** RunNo: **50524**

Prep Date: **3/30/2018** Analysis Date: **4/12/2018** SeqNo: **1638532** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.25								
Selenium	ND	2.5								
Zinc	ND	2.5								

Sample ID **LCS-37343** SampType: **LCS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **LCSS** Batch ID: **37343** RunNo: **50524**

Prep Date: **3/30/2018** Analysis Date: **4/12/2018** SeqNo: **1638534** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	25	2.5	25.00	0	99.0	80	120			
Copper	26	0.50	25.00	0	105	80	120			
Lead	24	0.25	25.00	0	94.2	80	120			
Selenium	21	2.5	25.00	0	85.7	80	120			
Zinc	25	2.5	25.00	0	99.6	80	120			

Sample ID **MB-37343** SampType: **MBLK** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **PBS** Batch ID: **37343** RunNo: **50524**

Prep Date: **3/30/2018** Analysis Date: **4/12/2018** SeqNo: **1638536** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	2.5								
Zinc	ND	2.5								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: DBS   Work Order Number: 1803B05   RcptNo: 1

Received By: Ashley Gallegos   3/20/2018 2:10:00 PM

Completed By: Dennis Suazo   3/20/2018 2:47:42 PM

Reviewed By: SZE 03/20/18

Labeled By MW 3/20/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Client

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐

   Samples were collected the same day and chilled.
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? Yes ☑ No ☐

    (Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? Yes ☑ No ☐

    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ______ (<2 or >12 unless noted)

Adjusted? ______

Checked by: ______

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ______ Date: ______

By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: ______

Client Instructions: ______

16. Additional remarks:

17. Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	12.3	Good	Not Present			

Chain-of-Custody Record

Client: DBSA

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:

X Standard ☐ Rush

Project Name: ABQ Daytona

Project #: DB17.1158 T8

Project Manager: Chad Johannesen

Sampler: E. Bastien

On Ice: ☐ Yes ☐ No

Sample Temperature: 12.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1803B05	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO) EPA 8015B	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) [VOCs]	8270 (Semi-VOA)	Chloride	Molybdenum, copper, aluminum	and zinc		Air Bubbles (Y or N)
3/20/18	11:15	Soil	Background_20180320	3-glass	—	001			X			X	X					X	X	X		
	11:40		Outfall_20180320			002			X			X	X					X	X	X		
	12:00		Pond1A_20180320			003			X			X	X					X	X	X		
	12:20		Pond1B_20180320			004			X			X	X					X	X	X		
	13:00		Pond2_20180320			005			X			X	X					X	X	X		

03/20/18

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/20/18	14:10	Elizabeth Bastien		03/20/18	1410
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Please hold soil for possible TCLP. Add 8260 to all. 3/30

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.