

NPDES Permit #IDS027561

Permit Appendix B - Annual Report Form

This Annual Report is due no later than January 30 of each year, beginning in Calendar Year 2023, and reflects the relevant reporting period, starting October 1, 2021. See Permit Part 6.4.2



Annual Reports and any attachments must be sent to IDEQ by U.S. Postal Mail to the following address:

Regional Administrator
Idaho Department of Environmental
Quality Attn: Water Quality Program
Boise Regional Office
1445 N. Orchard St.
Boise, ID 83706

Complete Sections 1 through IV. Do not leave any questions blank.

MS4 Permittee Name/Organization:

Boise State University

Permit Number: IDS027561

Reporting Period:

- ☐ Year 1 Reporting Period: Oct. 1, 2021 – Sept. 30, 2022 – Annual Report due date: January 30, 2023
- ☐ Year 2 Reporting Period: Oct. 1, 2022 – Sept. 30, 2023 – Annual Report due date: January 30, 2024
- ☒ Year 3 Reporting Period Oct. 1, 2023 – Sept. 30, 2024 – Annual Report due date: January 30, 2025
- ☐ Year 4 Reporting Period Oct. 1, 2024 – Sept. 30, 2025 – Annual Report due date: January 30, 2026
- ☐ Year 5 Reporting Period Oct. 1, 2025 – Sept. 30, 2026 – Annual Report due date: September 30, 2026
- ☐ Other

Certification: "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 gather and evaluate 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 have no personal knowledge that the information submitted is other than 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."

Signature:

A handwritten signature in blue ink, appearing to read "Drew Alexander", is written over a horizontal line.

Printed Name:

Drew Alexander

Title:

Assistant Vice President for Campus Operations

Date:

01/24/2025

Section I. General Information

MS4 Facility Site Name:

MS4 Facility Organization Formal Name:

MS4 Facility Contact Name:

Title:

MS4 Contact Telephone:

MS4 Contact Email Address:

MS4 Facility Contact Type (all that apply): ☐ Owner ☐ Operator ☒ Main Contact

MS4 Facility Site Address:

MS4 Facility Site City, State, Zip Code:

MS4 Facility Site Mailing Address: *if different from above*

Is the MS4 Facility Site Located On Tribal Land? ☐ Yes ☒ No

MS4 Facility Jurisdiction Type (check all that apply):

☐ Federal	☐ County
☐ State	☐ City or Town
☒ College or University	☐ Highway District
☐ State Highway Department	☐ Tribal
☐ Municipal:	☐ Other

List All Receiving Water(s) For the MS4 Discharges:

-See Appendix 2 to this document: "Dry Weather Outfall Inspection and Sampling Summary" for receiving waters for each outfall

-See Boise State University SWMP, Appendix C Boise State University MS4 Maps, for outfall locations.

Section II. Permittee Responsibility:

Please answer all questions. If the answer is “No,” or “Not Applicable” and no other direction is provided, use the Comments field at the end of this section to explain the reason and the expected date(s) that the requirement will be met, and/or to explain why the requirement does not apply.

1. **This Permittee organization shares implementation responsibility for Permit compliance with one or more Permittees.**

☒ Yes ☐ No ☐ Not Applicable

Is the agreement between the Permittees described/cited in the Stormwater Management Program (SWMP) Document?

☒ Yes ☐ No ☐ Not Applicable

2. **This Permittee organization shares implementation responsibility for Permit compliance with one or more outside (non-Permittee) entities.**

Is the agreement with these other entity(ies) described/cited in the SWMP Document?

☐ Yes ☒ No ☐ Not Applicable

3. **This Permittee organization maintains relevant ordinances or other regulatory mechanisms to control pollutant discharges into and from the MS4 to meet the requirements of the permit.**

☒ Yes ☐ No ☐ Not Applicable

(If “No,” use the Comment field to specify on overall progress to adopt adequate ordinances or utilizing available regulatory mechanisms.)

4. **This Permittee organization’s SWMP Document is posted on a publicly accessible website.**

☒ Yes

Identify the URL for the webpage where the SWMP Document can be accessed:

http://

☐ No

☐ Not Applicable

5. **The Permittee organization provided a summary of total costs associated with SWMP implementation over the reporting period.**

☒ Yes;

Note: Permit Part 6.4.2.2.5 requires Permittees to provide annual expenditures for the reporting period, and estimated budget for the reporting period following each Annual Report.

☐ No

☐ Not Applicable

6. This Permittee organization regularly tracks certain activities to set priorities and assess compliance with the Permit requirements.

- ☒ Yes ☐ No ☐ Not Applicable

7. During the reporting period, responsibility for SMWP implementation has changed due to a Transfer of Ownership or Operational Authority over a geographic portion of the MS4.

This Permittee’s SWMP Document has been updated to reflect these changes in responsibility for any new or transferred areas served by the MS4.

- ☐ Yes
 If yes, use the Comments field to provide a brief statement summarizing the change in ownership or operational authority.
- ☐ No
- ☒ Not Applicable

Section II Comments:

See Appendix 10 - Phase I MS4 Permit Annual Report Responses

Section III. Status of SWMP Control Measures

Please answer all questions for each SWMP control measure and associated component activity. In the Comments field, cite any relevant information and/or statistics that helps illustrate the Permittee's implementation of the required action/activity.

If the answer is "No," use the Comments field to explain the reason, and outline the expected dates that the requirement will be met.

If the requirement does not apply to the Permittee's organization, mark "NA" and explain why it does not apply in the Comments field.

Public Education, Outreach and Involvement Program (Permit Part 3.1)

8. This Permittee organization conducts an education, outreach, and public involvement program based on stormwater issues of significance in the Permittee's jurisdiction.
- ☐

 Yes, this organization conducts the education, outreach, and involvement activities required by the Permit
- ☒

 Yes, this organization works through contract with other entities to conduct the education, outreach, and involvement activities required by the Permit
- ☐

 No
- ☐

 Not Applicable
9. Target Audience: During the reporting period, this Permittee organization focused its education, outreach, and public involvement messages to the following audience(s):
- ☒

 General Public (including homeowners, homeowner's associations, landscapers, and property managers)
- ☒

 Business/Industrial/Commercial/Institutions (including home based and mobile businesses)
- ☒

 Construction/Development (e.g., Engineers, Contractors, Developers, Landscape Architects, Site Design Professionals)
- ☒

 Elected Officials, Land Use Policy and Planning Staff
- ☐

 Other (describe in Comments section below)
10. Topics: During the reporting period, this Permittee organization focused its education, outreach, and public involvement messages on the following topics (select all that apply):
- ☒

 General impacts of stormwater flows into surface water, and appropriate actions to prevent adverse impacts;
- ☒

 Impacts from impervious surfaces, techniques to avoid adverse impacts;
- ☒

 Yard care techniques protective of water quality, such as composting;
- ☒

 Proper use, application & storage of pesticides, herbicides, and fertilizers;

- ☒ Litter & trash control and recycling programs;
- ☒ BMPs for power washing, carpet cleaning, auto repair & maintenance;
- ☒ Low Impact Development/green infrastructure techniques, including site design, pervious paving, retention of mature trees/vegetation, landscaping and vegetative buffers;
- ☒ Maintenance of landscape features providing water quality benefits;
- ☒ Stormwater treatment and volume control practices;
- ☒ Technical standards for stormwater site plans; including appropriate selection, installation, and use of required construction site control measures
- ☒ Source control BMPs and environmental stewardship;
- ☒ Impacts of illicit discharges and how to report them;
- ☒ Actions and opportunities for pet waste control/disposal,
- ☒ Water wise landscaping, water conservation, water efficiency
- ☒ BMPs for use and storage of automotive chemicals, hazardous cleaning supplies, vehicle wash soaps and other hazardous materials;

11. During the reporting period, this Permittee organization began and/or continued distribution of the selected messages/activities to the intended target audience.

☒ Yes

Please summarize the message/activity conducted during the reporting period in the Comments section below.

☐ No

*Note: Permit Part 3.1.3 requires Permittees to conduct at least eight (8) educational messages or activities no later than **September 30, 2026**.*

☐ Not Applicable

12. During this reporting period, this Permittee organization assessed, or participated in efforts to assess, the understanding and adoption of intended behaviors by the target audience.

☒ Yes; *In the Comments section below, please summarize efforts to assess the selected education, outreach and public involvement activities conducted during the reporting period. If information is available, describe how this information is used to improve the education/outreach efforts.*

☐ No

☐ Not Applicable

13. During this reporting period, this Permittee organization offered (or worked with others to offer) training/education regarding construction site runoff control measures to site operators working in the Permittee's jurisdiction.

- ☒ Yes
☐ No

*Note: Permit Part 3.1.7.1 requires Permittees to offer outreach/training on construction site control measures at least once per year during the permit term, no later than **September 30, 2026**.*

- ☐ Not Applicable

14. During this reporting period, this Permittee organization offered (or worked with others to offer) training/education regarding permanent stormwater controls to audiences working in the Permittee's jurisdiction.

- ☒ Yes
☐ No

*Note: Permit Part 3.1.7.2 requires Permittees to offer outreach/training on permanent stormwater controls at least once per year during the permit term, no later than **September 30, 2026**.*

- ☐ Not Applicable

15. This Permittee organization maintains and promotes a publicly-accessible website that provides current SWMP-related information cited in Permit Part 3.1.8. This website was recently updated prior to submitting this Report.

- ☒ Yes

URL for the Permittee's webpage:

http://

- ☐ No
☐ Not Applicable

Comments on Public Education, Outreach, and Involvement Program:

Use this Comments field to explain or discuss unique implementation schedules, summarize nature of the education, outreach, and public involvement activities conducted during the reporting period

See Appendix 10 Phase I MS4 Permit Annual Report Responses

Illicit Discharge Detection and Elimination Program (Permit Part 3.2)

16. To the extent allowable pursuant to authority granted under Idaho law, this Permittee organization conducts and enforces a program to detect and eliminate illicit discharges into the MS4.

☒ Yes
☐ No

*Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary to comply with Permit Parts 3.2.2 through 3.2.9 no later than **April 3, 2026**.*

☐ Not Applicable

17. This Permittee organization maintains a current MS4 Map and Outfall Inventory as described in Permit Part 3.2.2.

☒ Yes
☐ No

*Note: Permit Part 3.2 requires Permittees to update their Map(s) and Inventory no later than **April 3, 2026**.*

☐ Not Applicable

18. To the extent allowable pursuant to authority granted under Idaho law, this Permittee organization prohibits non-storm water discharges into the MS4 (except those identified in Permit Part 2.4) through an ordinance or other regulatory mechanism.

☒ Yes – if yes, please provide citation/web address to the ordinance/regulatory mechanism:

https://boisestate.edu/policy/facilities-planning-campus-safety/policy-title-environmental-health-and-safety/

☐ No

*Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary no later than **April 3, 2026**.*

☐ Not Applicable

19. This Permittee organization maintains a dedicated telephone number, email address, and/or other means for the public to report illicit discharges,

☒ Yes – if yes, please provide phone number/web address:

Stormwater Pollution Prevention Hotline: 208-395-8888

☐ No

*Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary no later than **April 3, 2026**.*

☐ Not Applicable

20. This Permittee organization responds and investigates illicit discharge complaints or reports within two working days.

- ☒ Yes
- ☐ No

*Note: Permit Part 3.2 requires Permittees to revise and update their existing programs as necessary no later than **April 3, 2026**.*

- ☐ Not Applicable

21. Number of Public Complaints/Reports Received During this Reporting Period:

0

22. Number of Illicit Discharge Complaints/Reports Investigated through field visits, sampling or other follow-up action

0

23. Number of Illicit Discharge Complaints/Reports Resolved

0

24. This Permittee organization conducts a dry weather analytical and field screening monitoring program to identify non-stormwater flows from MS4 outfalls.

- ☒ Yes
- ☐ No
- ☐ Not Applicable

25. During the reporting period, this Permittee organization used its written protocols to prioritize and identify MS4 outfalls for dry weather discharge investigation.

- ☒ Yes
- ☐ No
- ☐ Not Applicable

26. Total Number of MS4 Outfalls in the Permittee’s jurisdiction of the Permit Area:

16

27. During the reporting period, this Permittee organization completed visual dry weather screening on at least 20% of MS4 outfalls.

- ☒ Yes
- ☐ No – Total # outfalls < 7, so only one outfall screened this reporting period
- ☐ Not Applicable

28. Of the 20% of MS4 outfalls screened during the reporting period:

How many outfalls were discharging during dry weather? 7

How many of these identified dry weather discharges were sampled or otherwise investigated to determine the discharge source? 5

How many of the identified dry weather discharges resulted in the Permittee action to address and eliminate the discharge source? 0

29. During this reporting period, how many of the Permittee's MS4 outfalls have been identified as having dry weather flows caused by irrigation return flow or ground water seepage?

Number of outfalls identified this reporting period

Total number of MS4 outfalls identified to date, as having dry weather flows from irrigation or groundwater seepage

*Note: Permit Part 3.2.6 requires Permittees to provide a complete list of MS4 outfalls locations identified as having dry weather flows caused by irrigation return flow or ground water seepage as part of the Permit Renewal Application no later than **April 3, 2026**.*

30. This Permittee organization maintains written spill response procedures and coordinates appropriate spill prevention, containment and response activities with other organizations in the Permit Area to ensure maximum water quality protection at all times.

☒ Yes

☐ No

☐ Not Applicable

31. This Permittee organization coordinates with appropriate local entities to educate employees and the public of the proper management and disposal or recycling of used oil, vehicle fluids, toxic materials, and other household hazardous wastes.

☒ Yes

☐ No

☐ Not Applicable

32. This Permittee organization's staff responsible for investigating, identifying and eliminating illicit discharges, spills, and illicit connections into the MS4 are trained to conduct such activities

☒ Yes

☐ No

☐ Not Applicable

Comments on Illicit Discharge Detection and Elimination Program:

Use this Comments field to explain any unique implementation schedules, highlight investigation results or follow-up actions, discuss subsequent enforcement actions, etc. that were conducted during the relevant reporting period.

See Appendix 10 Phase I MS4 Permit Annual Report Responses

Construction Site Runoff Control Program (Permit Part 3.3)

33. This Permittee organization uses an ordinance or other regulatory mechanism to require erosion, sediment, and waste material management controls at construction project site activity that results in land disturbance of one (1) or more acres and discharges to the MS4.

☒ Yes

☐ No

*Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026**.*

☐ Not Applicable

34. This Permittee organization requires construction site operators to submit construction site plans for Permittee review.

☒ Yes

☐ No

*Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026**.*

☐ Not Applicable

35. This Permittee organization inspects construction sites to ensure compliance with applicable requirements for erosion, sediment and waste material management controls.

☒ Yes

☐ No

*Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026**.*

☐ Not Applicable

36. This Permittee organization inspects construction sites using an inspection prioritization system.

☒ Yes

☐ No

*Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026**.*

☐ Not Applicable

37. This Permittee organization implements a written escalating enforcement response policy or plan (ERP) for construction site runoff control.

☒ Yes

☐ No

*Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026**.*

☐ Not Applicable

38. This Permittee organization ensures that all persons responsible for preconstruction site plan review, site inspections, and enforcement of construction site runoff control requirements are appropriately trained to conduct such activities – specifically, this organization provides orientation and training for new staff working on construction runoff control issues within the first six (6) months of employment.

☒ Yes

☐ No

*Note: Permit Part 3.3 requires Permittees to update their construction site runoff control requirements no later than **April 3, 2026**.*

☐ Not Applicable

Comments on Construction Site Runoff Control:

Use this Comments field to explain unique implementation schedules, summarize the number of site inspections, follow-up actions, and/or any subsequent enforcement actions, etc that were conducted during the relevant reporting period.

See Appendix 10 Phase I MS4 Permit Annual Report Responses

Post Construction Stormwater Management in New Development & Redevelopment
(Permit Part 3.4)

39. Through ordinance or other regulatory mechanism, this Permittee organization requires the installation and long-term maintenance of permanent stormwater controls at new development and redevelopment project sites that result from land disturbance of 5,000 square feet or more, excluding individual one- or two-family dwelling development or redevelopment and the infill or redevelopment of public pedestrian infrastructure projects. Required controls are sufficient to retain onsite the runoff volume produced from the first 0.6 inches of rainfall from a 24-hour event preceded by 48 hours of no measurable precipitation, and/or require runoff treatment providing equal or greater level of water quality benefit as this onsite retention standard.

☒ Yes

Please cite to the ordinance containing the permanent stormwater control requirements:

☐ No

Boise City Code 10-6-3, Stormwater Management Plans And Comprehensive Drainage Plans

*Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

40. This Permittee organization requires permanent storm water controls through written specifications.

☒ Yes

Please cite to the document containing the permanent stormwater control requirements:

☐ No

<https://www.achdidaho.org/home/showpublisheddocument/462/638243231741230000>

*Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

41. This Permittee organization requires preconstruction site plan review and approval for permanent storm water controls at new development and redevelopment sites.

☒ Yes

☐ No

*Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

41.b This Permittee organization cooperates in the implementation of the Green Infrastructure Strategy to employ innovative approaches to control stormwater quality and quantity in the Lower Boise River watershed.

Use this field below to describe any relevant Permittee actions during the reporting period, as applicable. .

42. This Permittee organization has identified high priority locations in the jurisdiction where the Permittee regularly inspects the installation, and long-term operation, of permanent stormwater controls.

☐ Yes

☒ No

*Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

43. This Permittee organization has an enforcement strategy to ensure and maintain the functional integrity of permanent stormwater controls within this jurisdiction.

☒ Yes

☐ No

*Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

44. This Permittee organization uses a database inventory to track and manage the operational condition of permanent stormwater controls within this jurisdiction.

☒ Yes

☐ No

*Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

45. This Permittee organization requires enforceable and transferable O&M Agreements, where parties other than this Permittee organization are responsible for operation and maintenance of permanent storm water controls?

☐ Yes

☐ No - *Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☒ Not Applicable

46. This Permittee organization ensures that all persons responsible for reviewing site plans for permanent stormwater controls and/or for inspecting the installation and operation of permanent controls are trained to conduct such activities

☒ Yes

☐ No - *Note: Permit Part 3.4 requires Permittees to update their permanent stormwater control requirements no later than **April 3, 2026**.*

☐ Not Applicable

Comments on Post Construction Stormwater Management in New Development and Redevelopment

Use this Comments field as necessary to explain any unique implementation schedules, summarize inspections, actions, etc. that were conducted during the relevant reporting period.

See Attachment 10 - Phase I MS4 Permit Annual Report Responses.

See Boise State University's SWMP Section 3.2 and the subsequent table, as well as Appendices 3 & 4 for PSC inspection summaries.

Stormwater Infrastructure and Street Management (Permit Part 3.5)

47. This Permittee organization inspects all MS4 catch basins and inlets in the jurisdiction at least once every two years and takes appropriate maintenance or cleaning action based on those inspections.

☒ Yes

☐ No – Permittee uses an alternate inspection & maintenance schedule as outlined in the SWMP Document.

☐ No

*Note: Permit Part 3.5 requires Permittees to update their pollution prevention and good housekeeping as needed to properly operate and maintain their MS4s no later than **April 3, 2026**.*

☐ Not Applicable

Total Number of catch basins and inlets inspected this reporting period

158.0

48. This Permittee organization operates and maintains Streets, Roads, Highways and/or Parking Lots in its jurisdiction in a manner that protects water quality and reduces the discharge of pollutants through the MS4.

☒ Yes

☐ No

*Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026***

☐ Not Applicable

49. This Permittee organization operates all street/road maintenance material storage locations in a manner that prevents pollutants in stormwater runoff from discharging to the MS4 or into any receiving waterbody. A description of each Material Storage Location is included in the SWMP Document, as required by Permit Part 3.5.4

☒ Yes

☐ No

Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than .

☐ Not Applicable

50. This Permittee organization sweeps all streets, roads, highways, and parking lots according to a sweeping management plan and the sweeping schedule outlined in Permit Part 3.5.5.

☒ Yes

☐ No

*Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026***

☐ Not Applicable

51. This Permittee organization has reviewed its operation and maintenance activities for the types of activities listed below and confirms that all such activities are conducted in a manner that protects water quality and reduces the discharge of pollutants through the MS4. Municipal Activities to be addressed include: grounds/park and open space maintenance operations; fleet maintenance and vehicle washing operations; building maintenance; snow disposal site operation and maintenance; solid waste transfer activities; municipal golf course maintenance; materials storage; hazardous materials storage; used oil recycling; and spill control and prevention measures for municipal refueling facilities.

☒ Yes

☐ No

*Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026***

☐ Not Applicable

52. This Permittee organization ensures appropriate practices to reduce the discharge of pollutants to the MS4 associated with the application, storage and disposal of pesticides, herbicides and fertilizers. All employees or contractors applying pesticides, etc. are instructed to follow all label requirements, including those regarding application methods, rates, number of applications allowed, and disposal of the pesticide/herbicide/fertilizer and rinsate.

☒ Yes

☐ No

*Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026**.*

☐ Not Applicable

53. This Permittee organization uses site specific Storm Water Pollution Prevention Plans for all Permittee-owned material storage facilities, heavy equipment storage areas, and maintenance yards located in the Permit Area.

☒ Yes

☐ No

*Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026**.*

☐ Not Applicable

54. This Permittee organization ensures that all persons responsible for municipal operations and maintenance activities are trained to conduct such activities

☒ Yes

☐ No

*Note: Permit Part 3.5 requires Permittees to update their requirements pollution prevention/good housekeeping for MS4 Operations no later than **April 3, 2026**.*

☐ Not Applicable

Comments on Stormwater Infrastructure and Street Management

Use this Comments field as necessary to explain any unique implementation schedules, summarize inspections, actions, etc. that were conducted during the relevant reporting period

Industrial and Commercial Stormwater Discharge Management (Permit Part 3.6)

55. This Permittee organization maintains an inventory of industrial & commercial facilities within the Permit Area, and inspects such facilities on a prioritized basis as required by Permit Part 3.6.

Use this comment box to summarize Permittee activities related to Permit Part 3.6.

Section V. Response To Excursions Above Idaho Water Quality Standards

56.

During this or any prior reporting period, did the Permittee submit written notification to EPA and IDEQ regarding MS4 discharge that are causing or contributing to an excursion above the WQS as directed by Permit Part 5.1?

☐ Yes – if yes, proceed to Q.56

☒ No

☐ Not Applicable
57.

During this or any prior reporting period, did the Permittee submit an Adaptive Management Report to EPA and IDEQ, as directed by Permit Part 5.2?

☐ Yes – if yes, proceed to Q.57

☒ No

☐ Not Applicable
58.

Provide a summary of the Permittee’s efforts to date that address the MS4 discharges contributing to the original water quality excursion, including the results of any monitoring, assessment, or evaluation efforts conducted during the reporting period.

See Attachment 10 - Phase I MS4 Permit Annual Report Responses

59. List any attachments submitted as part of this Annual Report:

Note: Part 6.4.2 requires an updated *Stormwater Outfall Monitoring Plan* to be submitted as part of the Year 3 Annual Report, due January 30, 2025.

Appendix 1 Boise State University SWMP - 2024
Appendix 2 Dry Weather Outfall Inspection and Sampling Summary 2024
Appendix 3 Vortex Structure Inspection Summary 2024
Appendix 4 Sand and Grease Structure Inspection Summary 2023
Appendix 5 Boise State University Storm Water Pollution Prevention Plan 2024
Appendix 6 2024 Public Education, Outreach and Involvement Program (including website data)
Appendix 7 Stormwater Outfall Monitoring Summary WY 2024
Appendix 8 Americana Subwatershed Monitoring Summary WY 2024
Appendix 9 Temperature Monitoring Summary WY 2024
Appendix 10 Phase I MS4 Permit Annual Report Responses

Appendix 1

Boise State University SWMP – 2024



Boise State University
Stormwater Management Program
(SWMP)

NPDES Permit No.: IDS-027561



Date	Revision	By
2023		Will Reynolds
12/18/24	Annual update	Jennifer Ellis

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C. Boise State University MS4 Map	
D. Boise State University Policy #9140 – Environmental Health and Safety	

Acronyms

The following acronym list is provided for those reading the Boise State University Storm Water Management Program.

ACHD	Ada County Highway District
BMP	Best Management Practice
CGP	Construction General Permit
CWA	Clean Water Act
EPA	Environmental Protection Agency
ERP	Enforcement Response Policy
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
IDEQ	Idaho Department of Environmental Quality
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
POC	Pollutant(s) of Concern
SPCC	Spill Prevention, Control and Countermeasure
SBOE	State Board of Education
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan

1 Introduction

1.1 Scope and Purpose

Boise State University's Storm Water Management Program (SWMP) is a comprehensive program plan designed to reduce the discharge of pollutants from Boise State's Municipal Separate Storm Sewer System (MS4) to the Maximum Extent Practicable (MEP). The goals of the program are to restore and protect the quality of the Boise River and its tributaries through control measures, Best Management Practices (BMPs), stormwater drainage system design, and engineering methods to control and minimize the discharge of pollutants from the MS4.

1.2 Applicability

Boise State University holds authority with the other Boise metropolitan area jurisdictions to discharge stormwater and allowable non-stormwater from MS4 outfalls to the Boise River and its tributaries under the National Pollutant Discharge Elimination System (NPDES) Permit IDS-027561, in compliance with the Clean Water Act (CWA). The newly issued and revised Permit IDS-027561 became effective October 1, 2021, and includes next generation MS4 program requirements for incremental implementation and applies to Ada County Highway District (ACHD), Boise State University, City of Boise, Idaho Transportation Department #3, Garden City, and Drainage District #3. A copy of the NPDES Permit IDS-027561 is provided in Appendix A.

This program document outlines the SWMP activities to be developed and implemented by the new permit, including: inventory of MS4 facilities and outfalls Boise State owns and operates, the control measures and program activities implemented to reduce the discharge of pollutants to the Boise River and its tributaries, related regulatory controls, and Boise State's participation and cooperation with other jurisdictions under the permit to ensure compliance with the conditions of the permit. Boise State's roles and responsibilities under the MS4 permit have been established by the updated Intergovernmental Agreement and Operating Guidelines among the Permittees in Appendix B.

1.3 Program Administration

The SWMP for Boise State University shall undergo annual evaluation and update, and revised SWMP documentation shall be included in each Annual Report submitted to the Environmental Protection Agency (EPA) and the Idaho Department of Environmental Quality (IDEQ), and made available electronically via the Partners for Clean Water and Environmental Health, Safety and Sustainability websites. The annually updated version of the SWMP is available to the public via online sources and is submitted in the Annual Report every January 30th.

2 Physical Description of the Boise State University MS4

Boise State University is Idaho's metropolitan university located next to the south bank of the Boise River, near the center of downtown Boise. Boise State University's 215-acre main campus is bordered to the north by the Boise River, to the south by Beacon Avenue, to the east by Broadway Avenue, and to the west by Ann Morrison Park with the majority of parcels between Beacon, University and Boise Avenues. Boise State University also maintains and oversees operations at three off site locations. The Boas Tennis Complex (10.5 acres) on Highland Avenue, University Plaza (1.84 acres) on Broadway, and the Yanke Research Park (8 acres) on Parkcenter Boulevard, all of which have impervious surface and drain to either the Boise River or a surface water canal system. Boise State manages active storm water outfalls which drain impervious surfaces such as parking lots and rooftops. Boise State has a number of onsite infiltration amenities for stormwater treatment on the premises rather than direct discharge to the storm drain system. Boise State University's main campus and off site areas are composed of buildings, maintained lawns, landscaped areas, concrete sidewalks, asphalt-paved driveways and parking areas, parking garages, certain streets owned by Boise State University, a sports stadium with roof areas and multiple artificial turf fields. A current map of the campus is included as Appendix C.

2.1 ACHD MS4 in Boise State University

All MS4 structures, facilities, and outfalls draining public streets and roadways adjacent to the campus and various streets and alleys within the interior campus are owned and operated by ACHD. ACHD is responsible for management, maintenance, and monitoring of the MS4 that are strictly in their right of way before they pass into the sections of the MS4 owned by Boise State University. The SWMP control measures designed specifically to accomplish the task of reducing pollutant discharges in the sections of the MS4 owned and operated by Boise State to the MEP are discussed in Section 3 of this SWMP. Additionally, the Intergovernmental Agreement and Operating Guidelines documents provide the necessary authority to manage, maintain, and monitor respective jurisdictional areas of responsibility.

2.2 Boise State University MS4

Separate from the ACHD MS4, Boise State University owns and operates municipal stormwater facilities and outfalls to the lower Boise River and its tributaries. Boise State currently has a total of twelve storm water outfalls which drain 233.5 impervious acres of surfaces such as parking areas, sidewalks, and rooftops. In addition, Boise State has a number of onsite infiltration amenities for stormwater treatment on the premises rather than direct discharge to the storm drain system. The main campus and both offsite locations at Highland Street and Parkcenter Boulevard, with drainage to the Boise River or a tributary, are comprised of ten sub-basin drainage areas which drain impervious surface to twelve separate outfalls. There are multiple permanent stormwater controls which are checked on a regular basis, including: five vortex treatment of sediment and debris, twenty-seven sand and grease separators, eight onsite infiltration systems, and 158 catch basins. Inspection frequency for all structures occurs on an annual basis and results of the inspections are included in the Annual Report. Structures are cleaned on an as-needed basis.

3 Storm Water Management Program Minimum Control Measures

This section describes the six minimum control measures that must be met by Boise State University's SWMP according to the NPDES permit Part II.B. The six minimum control measures are:

- ❖ Construction Site Runoff Control Program
- ❖ Storm Water Management for Areas of New Development and Redevelopment
- ❖ Industrial and Commercial Storm Water Discharge Management
- ❖ Storm Water Infrastructure and Street Management
- ❖ Illicit Discharge Management
- ❖ Education, Outreach, and Public Involvement

For each required control measure for which Boise State University holds responsibility, a description of existing or soon to be implemented activities that meet permit requirements are provided as well as schedules of implementation.

3.1 Construction Site Runoff Control Program

Boise State has implemented a program to reduce discharges of pollutants from all state owned construction activity occurring on the main campus or any of the satellite areas that are less than one acre. Projects which occur on state land and are greater than or equal to one acre are operated by the Division of Public Works and covered under the terms of the EPA issued *NPDES General Permit for Stormwater Discharge from Construction Activities in Idaho*, Permit #IDR12-0000, which manages pollutants in discharges to meet Idaho water quality standards.

Boise State University requires all projects on state land less than 1 acre in size to develop an Erosion and Sediment Control Plan (ESCP), which contains the same elements of a SWPPP. Enforcement authority is delegated by Boise State Policy number 9140. The *Catalog for Stormwater Best*

Management Practices for Cities and Counties produced by IDEQ serves as the required manual for construction storm water management controls. All ESCPs must be drafted and administered by an appropriately trained and educated Responsible Person / Plan Designer. The Intergovernmental Agreement outlines the cost share agreement for activities related to Public Education and Outreach lead by the City of Boise and Boise State participates for all aspects related to education of stormwater policies, regulations and requirements.

3.2 Storm Water Management for Areas of New Development and Redevelopment

New development and redevelopment on land owned by the State of Idaho for Boise State University is required by state policy to be designed to manage stormwater runoff and shall include permanent controls to protect water quality and restrict discharges to surface waters of the MS4. In general, the rate of stormwater runoff from any proposed land development shall not exceed the runoff rate prior to the development regardless of the storm event evaluated.

The IDEQ *Catalog for Stormwater Best Management Practices for Cities and Counties* shall be the adopted manual for which construction projects on Boise State University property shall comply.

Along with the other Permittees, Boise State shall develop a strategy to incentivize the increased use of LID. Boise State will evaluate the feasibility of incorporating runoff reduction techniques into the repair of streets, roads or parking areas by using canopy interception, bioretention, soil amendments, evaporation, rainfall harvesting, engineering infiltration, rain gardens, infiltration trenches, extended filtration and/or evapotranspiration and/or a combination of the aforementioned practices. If any practice is found to be feasible for a project with a start date after the effective date of this permit, all aspects of the project(s) will be reported in the Annual Report.

Developments with stormwater designs that require permanent controls are tracked and designated for inspection. Based on information gathered during the plan review process, permanent

controls to be installed are included on an inventory of existing permanent stormwater controls within Boise State’s jurisdictional control. Routine and final drainage system design inspections and reports are tracked and stored electronically on the network server. The summary of new structures incorporated in new projects is reported in the Annual Report.

To ensure that newly developed stormwater design systems and permanent controls are operated and maintained adequately, an Operation and Maintenance plan has been developed in conjunction with Boise State Landscape Services and the Department of Public Safety Transportation and Parking Services. Inspection, cleaning, and sweeping frequency are based on best available technology and EPA related guidance. The table on the following page shows the department and associated responsibilities.

Responsible Department	Description	Implementation	
		Inspection	Maintenance
FOM	Drop Inlets	Monthly	Cleaned as needed, after storm events, and during annual inspection.
	Retention Basins	Annually	Cleaned as needed.
	Parking Lots and Grounds	Daily	Floatables picked up daily as needed. Trash containers emptied daily or as needed.
	Sand/grease Separators, AquaSwirls	Annually	Cleaned as needed. Use appropriate equipment to remove sand, grease, floatables, and sediment accumulations.
	Catch Basins	Annually	Cleaned when appropriate.
EHSS	Sand/grease Separators, AquaSwirls	Annually	Inspected for presence of floatables, amount of grease, sediment depth and maintenance.
	Outfalls	Annually	Inspected for flow and maintenance.
	Catch Basins	Annually	Inspected for sediment depth and maintenance.
	Outdoor Liquid Storage	Annually	Inspected to verify that secondary containment is present and sufficient.
Transportation and Parking Services	Parking Structures	Three times per year	Swept by vacuum street sweeper.
	Parking Lots	Three times per year	Swept by vacuum street sweeper – Spring Break, Christmas break, beginning or end of Summer Session, or as needed.

3.3 Industrial and Commercial Storm Water Discharge Management

Boise State University has no industrial or commercial facilities which discharge into or within the operational jurisdiction of the University's MS4. Boise State University, along with the other Permittees, participates in a cost-share agreement which entails strategy development with ACHD and City of Boise to inventory and track those facility types and provide targeted education to reduce the discharge of pollutants.

3.4 Storm Water Infrastructure and Street Management

Boise State University manages its stormwater infrastructure and facilities to reduce the discharge of pollutants to the MEP. Management includes an inspection of permanent stormwater controls and structures, performing any maintenance or cleaning tasks, and implementing stormwater pollution prevention BMPs. This program does not apply to the MS4 structures and roadways in and around Boise State that are under ACHD jurisdiction. A current inventory map of Boise State owned roads and public parking lots is located in the Annual Report as Figure 1.

The Environmental Health, Safety and Sustainability office inspects all permanent stormwater structures located on Boise State owned streets, parks, and facilities once annually. If inspections reveal that maintenance is required for any structures, such as sweeping, replacing filter media, or catch basin cleaning, a work order is generated. Boise State University Facilities Operations and Maintenance and Transportation and Parking Services performs general maintenance, sweeping, and facility trash collection. An outside contractor provides pumping of the oil and water separators and catch basins. If BMPs need to be implemented to prevent the discharge of pollutants from a University facility, the Environmental Health, Safety and Sustainability office prescribes the correct BMP with guidance of the IDEQ *Catalog for Stormwater Best Management Practices for Cities and Counties*.

To manage and report on the inspection and maintenance program for Boise State stormwater infrastructure, an inventory of Boise State facilities and the stormwater structures are kept in a

spreadsheet and incorporated into facility maps. Inspections and maintenance activities are scheduled and tracked in the database to ensure an appropriate inspection frequency. All actions regarding stormwater management of Boise State's MS4 and facilities can be compiled and are summarized in the Annual Report. The current inventory of structures are: five Aqua-Swirls with vortex-type treatment of sediment and debris, twenty seven oil and water separators, eight onsite infiltration systems, and 158 catch basins.

Additional control measures intended to minimize or eliminate the discharge of pollutant from University facilities and operations include:

- Parking lot and pathway deicing – Boise State Landscape Services uses liquid magnesium chloride and pelletized ice melt during periods of ice and snow conditions and apply it in a manner which preserves safety and limits environmental impact. Solid deicing materials are stored inside and liquid deicer is stored in plastic dispensing system in a locked pervious yard.
- Pesticide, herbicide and fertilizer applications – Boise State Landscape Services is responsible for applications of pesticide, herbicide, and fertilizer on Boise State properties. All Landscape Services personnel are licensed and certified with the Idaho State Department of Agriculture. Pesticides are kept in secure indoor storage areas.
- Street and Parking lot repair – Street and parking lot repairs undertaken as a standalone project are overseen by Boise State project managers. All disturbances less than one acre are subject to completion of an ESCP and applicable BMPs.
- Litter control – Boise State Landscape Services performs daily trash pickup on the main campus and satellite locations. Boise State is a committee member of the Boise RiverSweep which is an annual Boise River clean up event. In addition to daily pickup, trash is collected after major events occurring on the campus.

- Manage sand stockpiles – Boise State Landscape Services maintains a stockpile of sand only for use in traction control on sidewalks and parking lots. The stockpile is located in a single location and is comprised solely of sand (no salt added) and is contained in a three sided pen in a large pervious and locked yard. Any runoff would not reach any portion of the MS4 or a receiving waterbody.

3.5 Illicit Discharge Management

An illicit discharge is any discharge that is not composed entirely of storm water, except discharges authorized under an alternate NPDES permit and discharges resulting from firefighting activities. Illicit discharges are prohibited in Boise State's MS4 and any illicit discharges or activities with the potential for illicit discharge are addressed accordingly and prohibited. A Treasure Valley stormwater pollution prevention hotline exists to serve the entire watershed and illicit discharge complaints are routed to the appropriate agency holding the jurisdictional responsibility for the location of the incident. The stormwater phone matrix is periodically reviewed and updated for most current contacts at each agency in the watershed area. A log is compiled by ACHD and submitted in the Annual Report following the previous reporting period. A map will be developed among the Permittees to identify the location, type and relative quantity or severity of the non-stormwater discharge to the MS4.

Boise State University received coverage under a separate NPDES Groundwater Remediation Discharge Permit (Permit # IDG911006) from EPA with an effective date of September 15, 2014 for discharges containing covered pollutants. All conditions of that permit will be reported according to those requirements and are not subject to reporting under conditions of the NPDES MS4 Phase 1 permit.

In addition to routine stormwater inspections, annual dry weather outfall screening serves to identify potentially problematic outfalls. In addition to visual observation inspections, field and lab samples will be taken in accordance with approved sampling protocol.

Boise State University also maintains a Spill Prevention, Control and Countermeasure Plan to identify all oil containing tanks or sources and maintains provisions to ensure accidental releases do not reach a navigable waterway.

3.6 Education, Outreach, and Public Involvement

Boise State University works with fellow Permittees to implement the requirements of the NPDES regarding education, outreach and public involvement. The Intergovernmental Agreement designates the City of Boise as the lead agency responsible for the Public Education program. To assist with program support, Boise State commits funding for its share of the annual costs associated with program administration, which is determined during the annual budget meeting held every January.

Working together under the name Partners for Clean Waters, the Permittees have developed a website to provide the general public and business partners' information regarding stormwater management, educational and volunteer opportunities, and to review the actions and activities completed annually by the Permittees at www.partnersforcleanwater.org. Boise State University also maintains a webpage dedicated to stormwater documents and resources located at www.boisestate.edu/operations/ehs/safety-programs/environmental-health/stormwater-management-program/. All applicable State and local public notice requirements are met by posting on multiple online sources.

Boise State University participates in various education and outreach activities to improve awareness and increase positive impacts within the community on the local watershed. The public involvement events focus around public health promotion, river cleanup, and educational conferences for which the Stormwater Coordinator actively participates.

4 Discharges to Water Quality Impaired Receiving Waters

In the IDEQ 2010 Integrated report, sections of the Boise River were found impaired by one or more of the following Pollutants of Concern (POC) for the purposes of this permit: total phosphorus, sediment, temperature, and E. coli. Boise State University prohibits all non-stormwater discharges to the MS4 and each of the six minimum control measures described in Section 3 of this SWMP are designed to prohibit or reduce the discharge of any listed POC. The following table shows each control measure and the POC and applicable controls associated with each measure.

Control Measure	POC and their Controls
Construction Site Runoff Control Program	Sediment; Construction site inspections, ESCP and SWPPP review, Permit violation referrals, Enforcement Response Policy
Storm Water Management for Areas of New Development and Redevelopment	Total phosphorus, sediment, temperature, E. coli; ESCP and SWPPP review, On-site retention systems, <i>Catalog for Stormwater Best Management Practices</i> incorporated into projects, assess feasibility of LID techniques on repair of public streets, roads or parking lots
Industrial and Commercial Storm Water Discharge Management	Total phosphorus, sediment, E. coli; All non-stormwater discharges prohibited, updated prioritized inventory to control high-priority areas
Storm Water Infrastructure and Street Management	Total phosphorus, sediment, E. coli; Maintenance of updated structures inventory, routine cleaning, and quarterly frequency for sweeping of streets and parking areas
Illicit Discharge Management	Total phosphorus, sediment, temperature, E. coli; Dry weather screening, outfall sampling, SPCC Plan, Pollution Prevention Hotline participation
Education, Outreach, and Public Involvement	Total phosphorus, sediment, temperature, E. coli; Cost share agreement and participation in quarterly meetings to assess program goals associated with Distribution of Eddy Approved Fact sheets, Responsible Person/Plan Designer

	training sessions, Business Partners target audience

To evaluate the effectiveness of Boise State's SWMP in reducing the discharge of POC to the MEP, water quality monitoring data for sections of the Boise River impacted by Boise State University discharges from its outfalls will be periodically reviewed to detect any reductions or increases in levels of POC compared to 2010 data. Sources of monitoring data include the ACHD, IDEQ, and HDR surface water quality and outfall monitoring programs. Boise State will provide all relevant sampling data to ACHD to inform the pollutant loading reduction effectiveness.

5 Monitoring, Recordkeeping and Reporting Requirements

The Intergovernmental Agreement in Appendix B designates the ACHD as the lead agency responsible for the implementation of the MS4 monitoring program. To assist with program implementation, Boise State commits funding for its share of the annual cost of the monitoring program, which is determined during the annual budget meeting held every January.

The Environmental Health, Safety and Sustainability office at Boise State University retains records of all data and information used in the development and implementation of the SWMP. All records are stored electronically on the University's server and in hard copy format for a period not less than five years. All records are accessible to the IDEQ and EPA upon request to the Environmental Health, Safety and Sustainability office during normal business hours.

Each year Boise State compiles an Annual Report for the NPDES required reporting period of October 1 through September 30 of the previous year. The Annual Report is submitted to ACHD, the agency responsible for coordinating the preparation and submittal of all Permittees' Annual Reports to the IDEQ and EPA by January 30th of each term.

Boise State's Annual Report shall follow the guidelines described in NPDES Permit Part 6.4.2. The tracking of plan reviews, inspections, enforcement actions, and stormwater infrastructure maintenance provide data and statistics that are included in the report. The Annual Report is used in assessing Boise State's compliance with permit conditions and implementation schedule.

6 Legal Authority

Each Permittee shall operate pursuant to legal authority established by statute, ordinance, or series of contracts. The prior Annual Reports used a state trespassing statute and water quality rules, cooperation with the campus police, and the Idaho Department of Environmental Quality for justification of sound legal authority to implement the Storm Water Management Plan.

Boise State University does not maintain the equivalent of a city code to regulate storm water discharges. However, the University does operate and maintain a storm water system which collects runoff from areas involved in a wide variety of uses including student housing, academic uses, research activities, science laboratories and recreational facilities.

The University has the authority to implement its storm water management programs and to control, regulate and enforce discharges to the storm water system through the statutory framework of the Idaho Code (I.C.). In particular, I.C. §33-105 grants to the Idaho State Board of Education (SBOE), Boise State University's governing authority, the power to "make rules for its own government and the government of its executive departments of office." Further, the SBOE, by its policies (Section I, subsection A(2) and Subsection E) grants to the President of Boise State University the power and responsibility to organize, manage, direct and supervise the institution pursuant to the framework of the Board's Governing Policies and Procedures. Under this grant of authority to the President, the University has enacted a broad range of policies, including regulations for the operation, management and maintenance of the storm water system, as well as the power to control illicit discharges, spills and dumping. The current Environmental Health & Safety policy 9140 and State of Idaho contracts express

this broad authority with reference to the University's obligations under the NPDES permit. In addition, through a contract between Boise State University and the City of Boise Police Department, administrators at the University are able to call City Police for assistance in enforcement. Boise State University has authority through the Intergovernmental Agreement in Appendix B to control pollutant discharges into and from its MS4 to meet requirements of the NPDES permit Part II.G. Below is a summary of the unique legal authorities which satisfy the five legal authority criteria specifically listed in the permit:

- ❖ Criteria 1: Must have authority to prohibit discharge of pollutants to the MS4 by illicit connections and discharges.

Satisfying legal authority: I.C. §33-105 and Boise State Policy #9140

- ❖ Criteria 2: Must have authority to control the discharge to the MS4 of spills, dumping, or disposal of materials other than stormwater.

Satisfying legal authority: Boise State Policy #9140

- ❖ Criteria 3: Must control through interagency agreements the contribution of pollutants from one portion of the MS4 to another portion of the MS4.

Satisfying legal authority: Intergovernmental Agreement for Roles and Responsibilities under the NPDES MS4 Permit IDS-027561 and Operating Guidelines which are attached in Appendix B.

- ❖ Criteria 4: Must have authority to require compliance with conditions.

Satisfying legal authority: Boise State Policy #9140

- ❖ Criteria 5: Must have authority to carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance and non-compliance with Permit conditions including the prohibition on illicit discharges to the MS4.

Satisfying legal authority: I.C. §33-105 and Boise State Policy #9140

Appendix A: Authorization to Discharge
Municipal Stormwater to the Boise River
under the National Pollutant Discharge
Elimination System (NPDES) Permit No.:
IDS-027561

Available online at: [https://www.boisestate.edu/operations/ehs/safety-programs/
environmental-health/stormwater-management-program/](https://www.boisestate.edu/operations/ehs/safety-programs/environmental-health/stormwater-management-program/)

Appendix B: Updated Intergovernmental Agreement among NPDES Permittees and Operating Guidelines

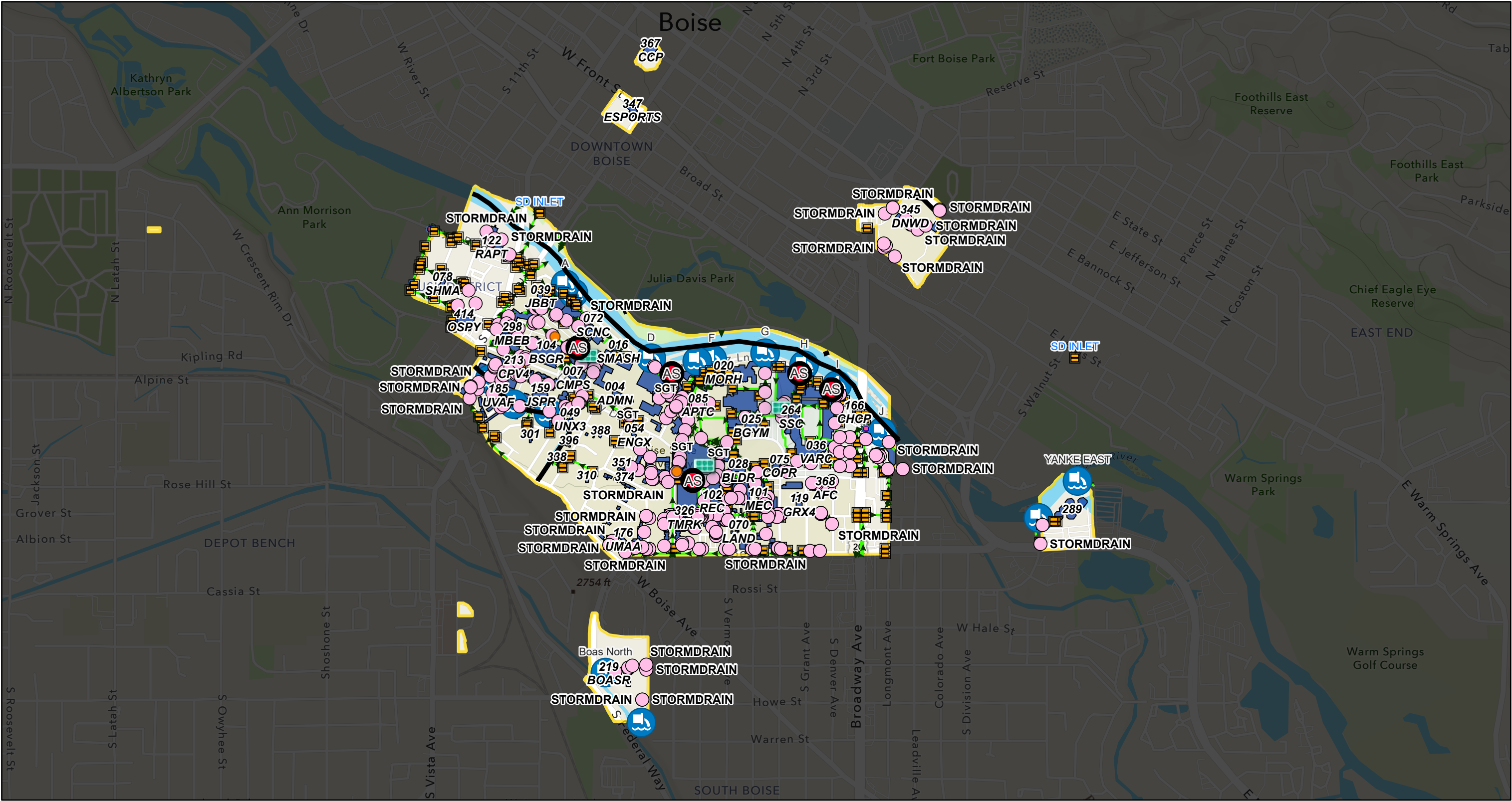
Available online at: <https://www.boisestate.edu/operations/ehs/safety-programs/environmental-health/stormwater-management-program/>

Appendix C: Boise State University MS4 Maps

This section includes 2 maps that shows a variety of stormwater control measures.

- 1) Overall map of Boise State University locations in Boise.
- 2) A close-up map of the main campus.

ArcGIS Web Map



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-  Aqua Swirls

 Sand And Grease Traps
-  GPSed Stormdrains

 STORMDRAIN

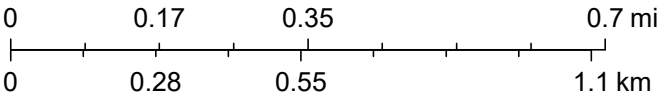
 Drainage
-  Storm Drain Inlet

 Pre-Treatment Structure

 Outfalls
-  Storm Drains Lines

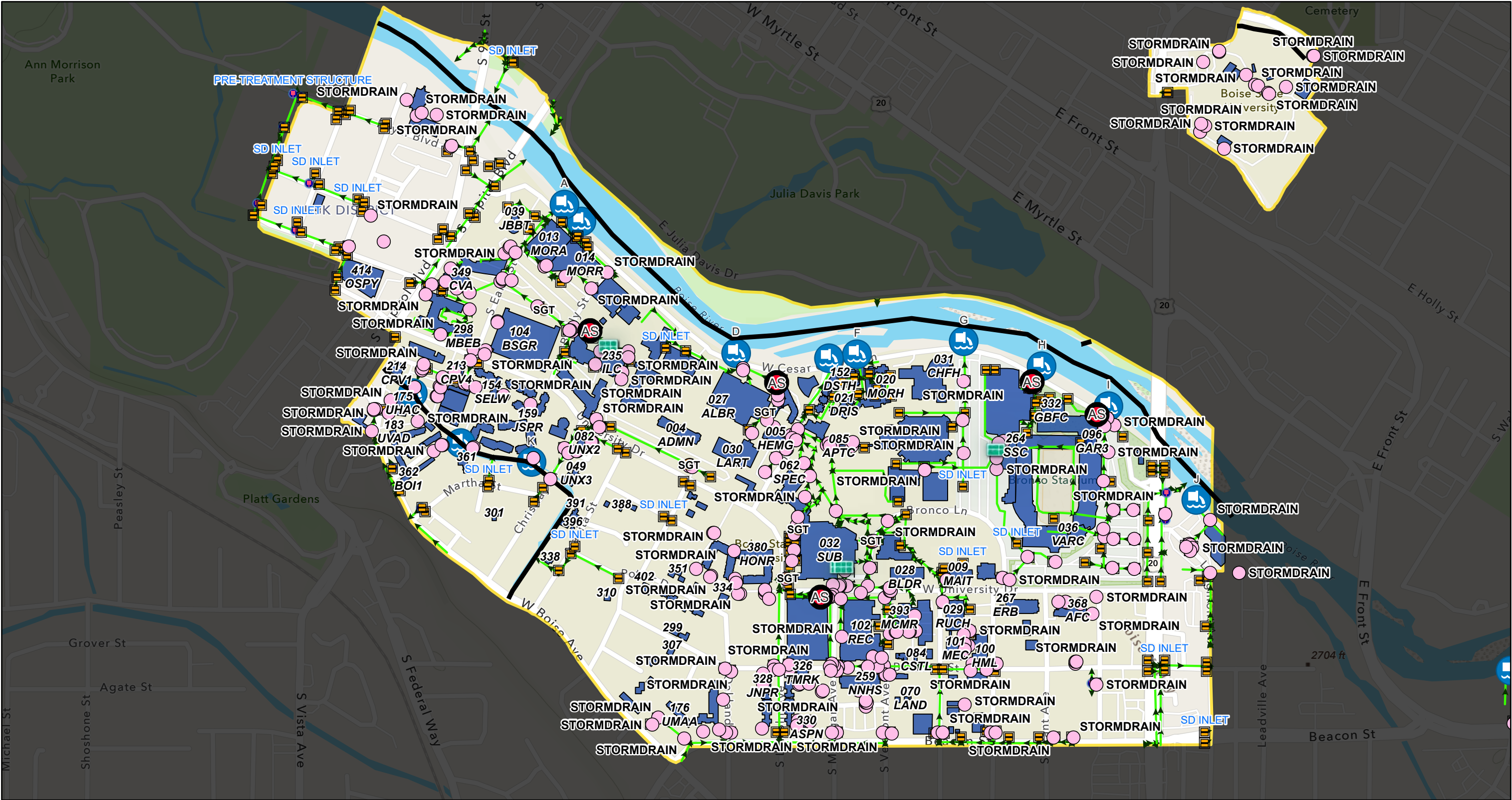
 Buildings

 Boise State Boundary



 Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

ArcGIS Web Map



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- Aqua Swirls

Sand And Grease Traps

GPSed Stormdrains

STORMDRAIN

Storm Drain Inlet

Pre-Treatment Structure

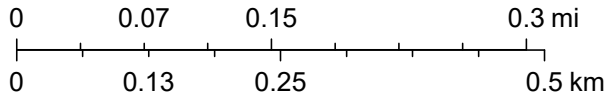
Storm Drains Lines

Buildings

Drainage

Outfalls

Boise State Boundary



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Appendix D: Boise State University Policy #9140 – Environmental Health and Safety

Available online at: <https://www.boisestate.edu/policy/facilities-planning-campus-safety/policy-title-environmental-health-and-safety/>

Appendix 2

Dry Weather Outfall Inspection and Sampling Summary - 2024

Outfall Inspection Summary

Outfall Name: Outfall A

Receiving Waters: Boise River	Pipe Type: SMP Pipe Size: 24"			Lat: 43.6076 Long: -116.2074	
Date: 8/21/2024 Personnel: KC, JE, KJ	Comments: Waders were needed to access this outfall for sampling. The outfall has a metal lid that was lifted to collect samples. Temperature and analytical results for E. Coli, ORP, Total P, and detergents exceed ACHD’s benchmark values. Dissolved oxygen (DO) is below benchmark levels.				
Structural Condition	Good				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Trickle	Flow Rate(cfs)	0.001

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
20.23	4.42	8.26	352.68	<0.1	<0.1	<0.1	5.79

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
>2419.6	43.2	0.166	0.412	0.01

Illicit Discharge?	Potential





Outfall Inspection Summary

Outfall Name: Outfall D

Receiving Waters: Boise River	Pipe Type: RCP Pipe Size: 36"			Lat: 43.6050 Long: -116.2034	
Date: 6/24/2024 Personnel: KC, EL	Comments:				
Structural Condition	Good				
Sedimentation	Rocky bottom				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Moderate	Flow Rate(cfs)	0.375

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
15.04	8.77	7.77	154.11	<0.1	<0.1	<0.1	1.78

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
160.7	2.00	0.0215	0.0216	0.01

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: BSU IR

Receiving Waters: Boise River	Pipe Type: ADS Pipe Size: 15”			Lat: 43.6049 Long: -116.2013	
Date: 8/27/2024 Personnel: KC	Comments: The presence of detergents exceeds ACHD’s benchmark value.				
Structural Condition	Good				
Sedimentation	Yes, a small amount of sediment is stuck to the sides of the pipe.				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Substantial	Flow Rate(cfs)	1.7125

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
18.29	8.36	7.49	84.28	<0.1	<0.1	<0.1	2.49

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
110.6	2.97	0.0101	0.0157	0.03

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall F

Receiving Waters: Boise River	Pipe Type: PVC Pipe Size: 12"			Lat: 43.6050 Long: -116.2005	
Date: 6/24/2024 Personnel: KC, JE, KJ	Comments:				
Structural Condition	Fair. Pipe is cracking at the ends but is still functional.				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall G

Receiving Waters: Boise River	Pipe Type: RCP Pipe Size: 12"			Lat: 43.6052 Long: -116.1980	
Date: 8/21/2024 Personnel: KC, JE, KJ	Comments: Temperature and the presence of detergents exceed benchmark values.				
Structural Condition	Fair. Pipe is cracking at the ends but is still functional.				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	Roots are growing in the pipe.				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Trickle	Flow Rate(cfs)	0.0028

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
22.8	7.88	8.52	697.31	<0.1	<0.1	<0.1	0.28

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
1.0	<0.900	0.0282	0.0305	0.02

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall H

Receiving Waters: Boise River	Pipe Type: SMP Pipe Size: 24"			Lat: 43.6047 Long: -116.1962	
Date: 8/21/2024 Personnel: KC, JE	Comments: Waders were needed to access the outfall for sampling. The metal lid at the end of the pipe was lifted for sample collection. The flow had some suds and a slightly milky color and cloudiness to it. Results exceed benchmark levels for temperature, turbidity, and E. Coli. Dissolved oxygen (DO) is below the benchmark level.				
Structural Condition	Good				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	Suds				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Trickle	Flow Rate(cfs)	0.0156

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
21.61	5.74	8.09	265.14	<0.1	<0.1	<0.1	58.1

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
1299.7	62.0	0.0990	0.231	0.05

Illicit Discharge?	Potential



Photo 1: Outfall with closed lid.



Photo 2: Outfall with lid opened for sampling.

Outfall Inspection Summary

Outfall Name: Outfall I

Receiving Waters: Boise River	Pipe Type: SMP Pipe Size: 24"			Lat: 43.6041 Long: -116.1947	
Date: 8/22/2024 Personnel: KC, EL, KJ	Comments: Water is pooled in front of the outfall. No flow.				
Structural Condition	Good				
Sedimentation	Some rocks in the pipe.				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall J

Receiving Waters: Boise River	Pipe Type: RCP Pipe Size: 15"			Lat: 43.6025 Long: -116.1925	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: This outfall will now be referred to as Outfall J. Cleaning is recommended.				
Structural Condition	Fair- full of sediment and unable to fully see the pipe.				
Sedimentation	11.5" of sediment and plant debris in the pipe.				
Staining	None				
Odor	None				
Vegetation	Excessive				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall K

Receiving Waters: Drain A	Pipe Type: PVC Pipe Size: 10"			Lat: 43.6032 Long: -116.2081	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: This outfall was previously referred to as Outfall J but will now be called Outfall K. Outfall pipe is surcharged (below water level) by Drain A. The sand and grease trap connecting to the outfall had a dumpster on it at the time of inspection. The dirty side of the sand and grease trap has a slotted lid. No flow was observed entering the system through the slotted lid.				
Structural Condition	Good				
Sedimentation	None – Unable to access pipe or structures to confirm.				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall L

Receiving Waters: Drain A	Pipe Type: PVC Pipe Size: 10"			Lat: 43.6034 Long: -116.2096	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: The outfall pipe was visible but inaccessible behind a fence. Unable to capture a clear photo of the pipe. The inspection was completed at the clean side of the connected sand and grease trap. No flow was observed.				
Structural Condition	Good				
Sedimentation	None				
Staining	Flow line				
Odor	None				
Vegetation	Typical vegetation around outfall pipe.				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Outfall M

Receiving Waters: Drain A	Pipe Type: PVC Pipe Size: 8"			Lat: 43.6035 Long: -116.2099	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: Unable to find the outfall pipe or any connecting structures.				
Structural Condition	Unknown				
Sedimentation	Unknown				
Staining	Unknown				
Odor	Unknown				
Vegetation	Unknown				
Floatables (Not Trash)	Unknown				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely

Outfall Inspection Summary

Outfall Name: Outfall N

Receiving Waters: Drain A	Pipe Type: PVC Pipe Size: 12"			Lat: 43.6044 Long: -116.211	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: The lip of the manhole blocks the view of pipe. Inspection was completed at the first manhole back. Standing water but no flow was observed.				
Structural Condition	Good				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	None				
Floatables (Not Trash)	None				
Trash Observed	No	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Yankee West

Receiving Waters: Boise River	Pipe Type: CMP Pipe Size: 18"			Lat: 43.5996 Long: -116.1851	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: Flow was observed at this outfall, but samples were not taken. Flow source appears to be from sprinkler runoff.				
Structural Condition	Good				
Sedimentation	Sediment and vegetation debris along bottom of the pipe.				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Trickle	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Yankee East

Receiving Waters: Boise River	Pipe Type: CMP Pipe Size: 12"			Lat: 43.6008 Long: -116.1835	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: Flow was observed but was too shallow and slow to collect samples or flow readings. Outfall pipe has a metal cap on the end that was lifted during inspection.				
Structural Condition	Good				
Sedimentation	About 0.5 inch of sediment in the pipe.				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	Yes	Amount	Trickle	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Boas N

Receiving Waters: Drain A	Pipe Type: PVC Pipe Size: 12"			Lat: 43.5944 Long: -116.2057	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments: The photo was taken from the other side of Drain A. The pipe is surrounded by berry bushes making it inaccessible.				
Structural Condition	Good				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	Excessive				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Outfall Inspection Summary

Outfall Name: Boas S

Receiving Waters: Drain A	Pipe Type: CMP Pipe Size: 12"			Lat: 43.5927 Long: -116.2039	
Date: 8/22/2024 Personnel: KC, EL, JE, KJ	Comments:				
Structural Condition	Good				
Sedimentation	None				
Staining	None				
Odor	None				
Vegetation	Typical				
Floatables (Not Trash)	None				
Trash Observed	None	Trash Rank	--	Trash Source	--
Flow	None	Amount	--	Flow Rate(cfs)	--

Results:

Temp (C)	DO (mg/L)	pH (S.U.)	Cond (uS/cm)	Chlorine	Copper	Phenols	Turbidity (NTU)
--	--	--	--	--	--	--	--

E.Coli (MPN)	TSS (mg/L)	ORP (mg/L)	Total P (mg/L)	Detergents (mg/L)
--	--	--	--	--

Illicit Discharge?	Unlikely



Appendix 3

Vortex Structure Inspections Summary

Boise State University Vortex Structure Inspections

Inspected by: Jennifer Ellis

Item #	Storm Water Structure	Location	Date	Depth to static water level from rim (inches)	Depth to Bottom of Tank from rim (inches)	Depth of water (inches)	Sediment Depth (inches)	% of sediment depth to water depth (inches)	Requires Cleaning (Y/N)	Floatables (Y/N)	Notes
1	A-Drainage	N. Side of Multi-Purpose Classroom (123)	11/19/2024	57	91	34	10	29.41%	N	N	This vortex was not accessible. It is completely buried due to the new housing building construction. Will have to wait to inspect when conditions change with housing project. This could be sometime in spring 2025.
2	D-Drainage	N. Side of Alberstons Library (027)	11/20/2024		148						Gate was locked (11/19/24, Tuesday). Reached out to Jordan Feeney, Assitant AD Operations, to open gate at a later date. Gate was open on 12/2 (Monday) because dumpsters were getting emptied. Stinky
3	H-Drainage	NE of Caven-Williams Complex (234)	12/2/2024	106	170	64	14	21.88%	Y	Y	
4	I-Drainage	N. of Bleymer Football Center (332)	11/19/2024	148	148	0	0		N	N	
5	Lincoln Garage	N. Side of Lincoln Ave. Garage (255)	11/19/2024	52	141	89	18	20.22%	Y	Y	Stinky

Appendix 4

Sand and Grease Structure Inspection Summary

The following table is representative of institutional knowledge at Boise State University concerning sand and grease traps (oil-water separators). As I, Jennifer Ellis, Environmental Compliance and Sustainability Manager at Boise State University, started my position 7/8/2024, I have reason to believe this list needs to be verified. Continuing research, especially GIS location verification, in-person inspection, and due diligence is being performed to verify the information in this following table. We will continue to investigate these stormwater control systems and prepare a more verified list and inspection for WY2024-2025.

	A	B	C	D	E	F
1	Boise State University Sand and Grease Separators					
2	Inspected by: Will Reynolds					
3	Date: 9/22/2023					
4	Structure	Location	Drainage	1° Sediment depth (in)	2° Sediment depth (in)	Comments
5	Oil-water separator	Health Science Riverside - West	Health Science Riverside - West	3	0	Depth to invert - 42" in secondary
6	Oil-water separator	Health Science Riverside - East	Health Science Riverside - East	3	0	Depth to invert - 40" in 1°; 40" in 2°
7	Oil-water separator	Health Science Riverside - South	Health Science Riverside - South	10	2	Depth to invert - 39" in 1°; 39" in 2°
8						
9	J-2, oil-water separator	just east of sign shop, Chrisway Drive	J-drainage, Admin parking lot	6	1	
10						
11	Oil-water separator	Gateway Center, rear parking lot	Gateway Center, parking lot, roof?	1	0	Depth to invert - 41" in 1°; 41" in 2°
12	Oil-water separator	Gateway Center, northeast corner of east parking lot	Gateway Center, east parking lot	7	0	
13	Oil-water separator	University Square in east parking lot off southeast corner	east parking lot University Square	5	0	Depth to invert - 25" in 1°, 49" in 2°
14	Oil-water separator	University Square in landscape strip off southeast corner	west parking lot University Square	6	2	Depth to invert - 24.5" in 1°; 24.5" in 2°
15						
16	A-14, Oil-water separator	parking lot N of Brady parking garage	A-drainage, parking lot N of Brady parking garage	4	1	Depth to invert - 39"
17						
18	CV-8, Oil-water separator	<u>Capitol Village</u> , north side of Chalet	Chalet Drive & roof drains	5	0	
19	CV-6, Oil-water separator	<u>Capitol Village</u> , center of parking lot	University & Earle, Chalet Drive	28	8	Depth to invert - 52" in 2°
20	CV-4, Oil-water separator	<u>Capitol Village</u> , west of Bookstore warehouse, south unit	Capitol Village parking lot & roof drain Bookstore warehouse	8	1	Depth to invert - 45" in 1° / 2°
21	CV-5, Oil-water separator	<u>Capitol Village</u> , west of Bookstore warehouse, center unit	Capitol Village parking lot & roof drain Bookstore warehouse	9	0	45" in 1° and 45" in 2°
22	CV-11, Oil-water separator	<u>Capitol Village</u> , west of Bookstore warehouse, north unit	Capitol Village parking lot	6	2	
23	Pump Chamber	<u>Capitol Village</u> , bookstore loading dock	<u>Capitol Village</u> , bookstore loading dock	2	0	Trough drainage to pump chamber, then west to wet well and french drain
24						
25	Oil-water separator	<u>University Village</u> , west of 2570	University Village Apartments parking lot	1	0	Floatable - grease Depth to invert - 36" in 1°; 66" in 2° Primary chamber has a catch pan
26	Oil-water separator	<u>University Village</u> , south of 2530	University Village Apartments parking lot	1	0	Depth to invert - 40" in 1°; 79" in 2° Primary chamber has a catch pan
27						
28	Oil-water separator	Lincoln Garage	West half of Lincoln Garage interior	4	0	32" in 1° and 2°
29						
30	Oil-water separator	Bookstore plaza in the sidewalk	SUB- Bookstore plaza and roof drainage	2	0	45" in 1° and 45" in 2°
31	Oil-water separator	<u>SUB loading dock</u>	Loading dock and roof drainage on expansion area	3	0	45" in 1° and 45" in 2°
32	Oil-water separator	<u>SUB plaza area</u>	West half of Bronco Circle	3	6	36" in 2°
33						
34	B-2, Oil-water separator	<u>North of Morrison Center</u>	Area B	4	2	Depth to invert - 42" in 1° and 2°
35						
36	Oil-water separator	Boas Tennis Center	Parking lot south	3	0	
37	Oil-water separator	Boas Tennis Center	End of parking lot south treatment	0	0	into ditch
38	Oil-water separator	Boas Tennis Center	Parking lot north	1	0	41" in 1°
39	Oil-water separator	Boas Tennis Center	Highland/Oakland intersection street drainage	3	0	42" in 1° and 38" in 2°
40						
41	Oil-water separator	University Park Apts	Lusk St.	5	0	41" in 1° and 38" in 2°

Appendix 5

Boise State University Storm Water Pollution Prevention Plan

T



BOISE STATE UNIVERSITY

Boise State University
Storm Water Pollution Prevention Plan
NPDES Permit No.: IDS-027561



Date	Revision	By
2023		Will Reynolds
1/7/2025	Annual update	Jennifer Ellis

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Acronyms

The following acronym list is provided for those reading the Boise State University Storm Water Pollution Prevention Plan.

ACHD	Ada County Highway District
BMP	Best Management Practice
CGP	Construction General Permit
CWA	Clean Water Act
EHSS	Environmental Health, Safety and Sustainability
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
IDEQ	Idaho Department of Environmental Quality
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
POC	Pollutant(s) of Concern
SPCC	Spill Prevention, Control and Countermeasure
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan

Background and General Requirements

Boise State University is covered as a Permittee under the National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Stormwater Permit number IDS-027561 along with Ada County Highway District (ACHD), Boise City, Garden City, Idaho Transportation Department, and Drainage District #3. The NPDES program is a requirement of the federal CWA and is overseen by Idaho Department of Environmental Quality (IDEQ) and EPA, Region X. The Phase I Permit requires that all Permittees develop a storm water management program (SWMP) aimed at reducing the discharge of pollutants into the Permittees' municipal separate storm sewer system (MS4).

A required component of the SWMP is the implementation of an operations and maintenance (O&M) program designed to prevent or reduce pollutant runoff from municipal operations and from Permittee-owned stormwater facilities. One requirement of the O&M program is the development of a storm water pollution prevention plan (SWPPP) for all heavy equipment maintenance and storage yards, and material storage facilities.

This SWPPP has been developed to meet the O&M requirements outlined above. This SWPPP must be implemented on the main Boise State University campus for the Landscape Services facility located at 1110 Vermont St., Boise, ID 83725, with certain elements applicable to the Facilities, Operation and Maintenance facility, located at 1311 Belmont St., Boise, ID 83725.

SWPPP Availability

A copy of this SWPPP will be kept at the Environmental Health and Safety office located at 1129 Euclid Ave., Boise, ID 83725 on the Boise State University campus. It will be made available to IDEQ and EPA personnel on request. A copy of this SWPPP will be made available to the public with in a reasonable time frame on the Environmental Health, and Safety website at <https://www.boisestate.edu/operations/ehs/stormwater-management-program/>.

SWPPP Update

This SWPPP will be reviewed annually and updated as necessary to reflect changed site conditions.

Objectives of the SWPPP

This document serves as the SWPPP for the Boise State University main campus for all heavy equipment maintenance and storage yards, and material storage facilities.

The objectives of this SWPPP are:

- To identify locations of all materials that could cause pollution if spilled or otherwise released into the environment;

- To identify all storm sewer conveyances, treatment facilities, and discharge points to aid in the isolation of contaminants should any be spilled into the system;

To identify locations of spill containment equipment and materials;

To implement and maintain best management practices (BMPs) that identify, reduce, eliminate, and/or prevent the discharge of stormwater pollutants;

To prevent violations of State surface water quality, groundwater quality, and sediment management standards; and

To eliminate unpermitted discharges and other illicit discharges to separate storm drainage systems.

Provide information to staff on BMPs for the O&M yards.

This document describes the methods and procedures that Boise State University will implement in order to reduce and/or eliminate the contamination of stormwater runoff and discharges of pollutants from Boise State facilities.

This SWPPP contains BMPs that Boise State facilities will implement to reduce or eliminate the release of pollutants to the MS4 and surface waters.

This document includes the following information:

- Definition of SWPPP Coordinator requirements and responsibilities

- Identification of Pollution Prevention Team personnel

- Facility description and activities

- Description of BMPs

- Description of monitoring, inspection, and recordkeeping requirements

NPDES Permit Coverage

Boise State's stormwater discharges are authorized under the terms and conditions of the Phase I Permit; effective October 1, 2021, through September 30, 2026. Boise State is responsible for the operation and maintenance of the portions of the MS4 under our jurisdictional control, including all flow control and permanent stormwater BMP controls located at its facilities.

Integration with Other Coverage

Boise State University also operates under a separate NPDES permit for Groundwater Remediation Discharge Facilities in Idaho under Permit number IDG911000. The Permit became effective September 15, 2014 and will expire September 30, 2026. Any construction activities that occur on these sites will be assessed for NPDES CGP coverage requirements and integrated with this plan as appropriate.

Facility Assessment

Boise State University facilities requiring this SWPPP, according to NPDES Permit requirements, are:

1. Leatherman Peak (390) – Facilities, Operation and Maintenance occupies this facility, which contains a large dumpster roll off and stores deicing materials used on campus property
2. Landscape Services (099) – an operations and maintenance facility that maintains and stores heavy equipment and stores materials used on campus property.

Pollution Prevention Team

The pollution prevention team is responsible for developing the SWPPP and assisting in its implementation, maintenance, and modification. The activities and responsibilities of the pollution prevention team address all aspects of this SWPPP.

The responsibilities include:

Assigning individuals by name and title to be responsible for developing the SWPPP and assisting the SWPPP Coordinator in its implementation, maintenance, and modification;

Holding regular meetings to review the overall operation of the BMPs;

Establishing responsibilities for inspections, O&M, and emergency situations; and

Arranging the training of all team members in the operation, maintenance, and inspections of BMPs.

A list of team members, contact information, and a brief description of their primary area of responsibility regarding stormwater pollution is identified in Table 1.

Table 1. Pollution Prevention Team

Position	Name(s)	Phone Number(s)	Primary Responsibilities
SWPPP Coordinator	Jennifer Ellis– Environmental Compliance Manager, EHS	(208) 426-140	Ensure that each facility employee is in compliance with the SWPPP regarding their operations; the coordinator must certify the completeness and accuracy of the SWPPP by signing a certification statement.
O&M Support	Gabe Bishop – Landscape Services Manager	(208) 426-2342	Ensure that BMPs listed are in place, operative, and effective at all times in and around the areas where activities that impact stormwater are conducted. Maintain secondary containment and stockpiles. Report any accidental spills to the coordinator.
O&M Support	Torrance Thomas – Manager, Public Safety - Transportation	(208) 426-4331	Ensure that BMPs listed are in place, operative, and effective at all times in and around the areas where activities that impact stormwater are conducted. Maintain secondary containment and report any accidental spills to the coordinator.

Operations and Maintenance

Activities conducted at the Boise State University main campus include:

- Washing and pressure washing of vehicles, equipment and building structures
- Loading and unloading of liquid or solid materials
- Automotive repair and maintenance
- Landscaping, lawn and vegetation management
- Painting of buildings
- Outdoor storage or transfer of solid raw materials, byproducts or finished products
- Outdoor portable container storage
- Storage of liquids in permanent aboveground tanks
- Parking lot maintenance and storage of vehicles and equipment
- Storage of bulk dirt, sand and rock
- Storage of collected street waste solids and other stormwater facility solids
- Storage of miscellaneous maintenance hand-held tools and equipment

Facility Maps

Operations Facility maps are included in Appendix A of this document. The Operations Facility maps identify the facility layouts; spill kit locations; stormwater drainage system; heavy equipment maintenance and storage areas; and material storage areas.

Receiving Water and Wetlands

In general, stormwater runoff from Boise State facilities includes runoff from buildings, parking lots, a gravel storage yard/parking lots, and other paved areas. The stormwater runoff discussed in this SWPPP is conveyed to the MS4, specifically, through outfalls to the north of the facilities on the main campus. The maintenance yards listed in this Plan are all located either on pervious dirt lots, or on areas which drain directly into onsite seepage beds. A map is included in Appendix A that shows the receiving water in relation to the campus where on site drainage is not available.

Potential Pollutants of Concern

Table 2 below lists proper management utilization of the source control BMPs. These BMPs are from the Idaho Department of Environmental Quality Catalog of Stormwater Best Management Practices, version April 2020. The BMP numbers listed are specific to the Volume and Section from which they are excerpted. Each BMP lists the description, applications, limitations, targeted pollutants, guidelines and maintenance. BMPs identified in Table 2 are included in Appendix B of this document.

Table 2. List of Relevant BMPs

Idaho Department of Environmental Quality Catalog of Stormwater Best Management Practices

Section 4: BMP Fact Sheets

BMP 15: Oil and Water Separators
BMP 16: Centrifugal or Vortex-Separation Structures
BMP 43: Dust Control
BMP 44: Stockpile Management
BMP 46: Spill Prevention and Control
BMP 48: Hazardous Materials Management
BMP 51: Solid Waste Storage and Disposal
BMP 75: Street Sweeping
BMP 76: Storm Water System Cleaning
BMP 77: Outdoor Storage
BMP 78: Fertilizer Management
BMP 79: Pesticide Management
BMP 80: Building and Grounds Maintenance
BMP 82: Equipment Yard Design Features
BMP 83: Vehicle and Equipment Refueling
BMP 84: Vehicle and Equipment Cleaning, Maintenance & Repair
BMP 86: Non-storm water Discharges to Drains
BMP 91: Employee Training

Historical Spills and Leaks

Boise State University will retain spill history records and maintain a copy of their own spill records for a minimum of five years. A copy of the spill records will be available for review during business hours at the Environmental Health, and Safety office. Records will include all of the significant spills or leaks of oils and toxic or hazardous pollutants that have occurred at areas either exposed to precipitation or that drain to a stormwater conveyance.

A significant spill or leak is defined as any quantity of contaminant that enters a storm drain or receiving water or contaminates soil and/or surface water at levels above state water quality standards. Also, any spill of oil or gas that exceeds the reportable quantity as described by the US Department of Energy is considered significant and will be documented and reported as necessary. Reportable quantities of chemicals used at each facility can be determined by entering the chemical name or chemical abstract service (CAS) number into the reportable quantity calculator on the US Department of Energy website (<https://rqcalculator.projectenhancement.com/>).

Monitoring Plan

Stormwater monitoring is not required for discharges leaving the Boise State facility.

Illicit Discharges

Illicit discharges are noted during annual dry weather outfall inspections occurring as part of the SWMP requirements of the MS4 Phase I Permit. When Permit required dry weather screening identifies an illicit discharge which necessitates sampling, Boise State will partner with ACHD to conduct the necessary grab samples identified in the Permit following the dry weather outfall screening guidelines established by ACHD, who leads all Permit-required monitoring.

Reporting and Recordkeeping

Records of all inspections, observations, and compliance records, as applicable, will be kept by the EHS office on-site for a minimum of five years. Copies of these records shall be provided upon request.

Inspections

Staff identified in the pollution prevention team must regularly inspect all sites where heavy equipment maintenance or storage and material storage are exposed to stormwater and assess how well stormwater BMPs are operating. Complete, routine inspections must occur annually.

If at any time a BMP is not effective, it must be repaired or maintained before the next anticipated storm event. If maintenance prior to the next storm event is not possible, maintenance must be completed as soon as possible and documented on the form for the extended repair schedule. In the interim, back-up measures must be implemented to ensure that stormwater quality is not diminished.

Concluding Statement

The intent of this SWPPP is to prevent the introduction of pollutants into stormwater from Boise State facilities. Full implementation of this plan includes regular staff training as well as compliance checks to ensure that BMPs are being utilized consistently and correctly.

This document is considered a 'living document', meaning that it can and should be updated as often as necessary to ensure that BMPs are employed to the MEP and minimize the discharge of pollutants from these facilities.

Appendix A – Facility Maps

Operations Facility Maps for SWPPP

January 2025

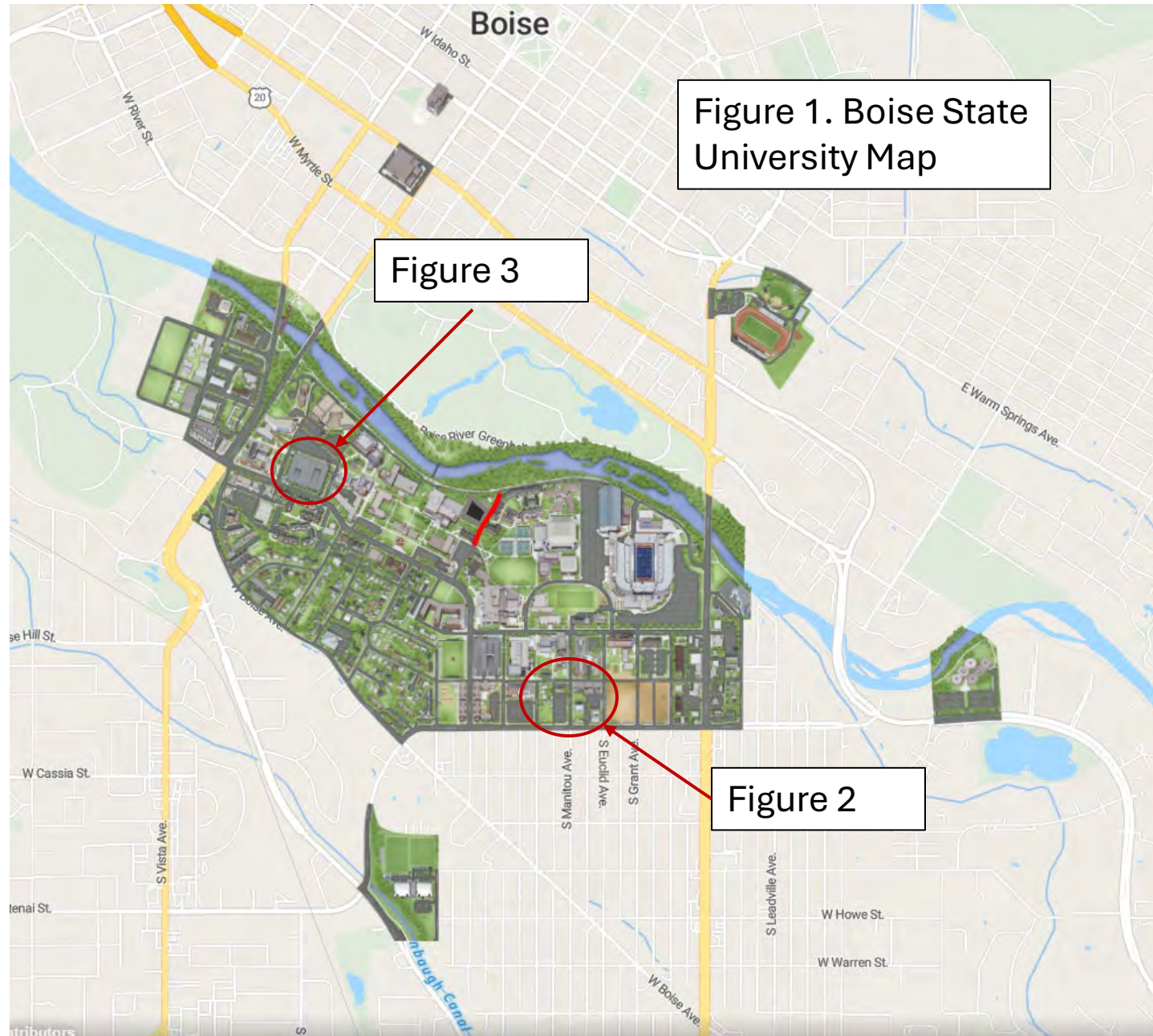
By Jen Ellis

Figure 1. Boise State University Map

Figure 2. Location for

- Heavy Equipment Maintenance and Storage Area
- Material Storage Area
- Deicer
- Spill Kit
- Facilities, Operations and Maintenance
- Hazardous Waste Storage
- Vehicle Wash Station
- The office location for Jen Ellis, Environmental Compliance and Sustainability Manager

Figure 3. Street Sweeper Storage



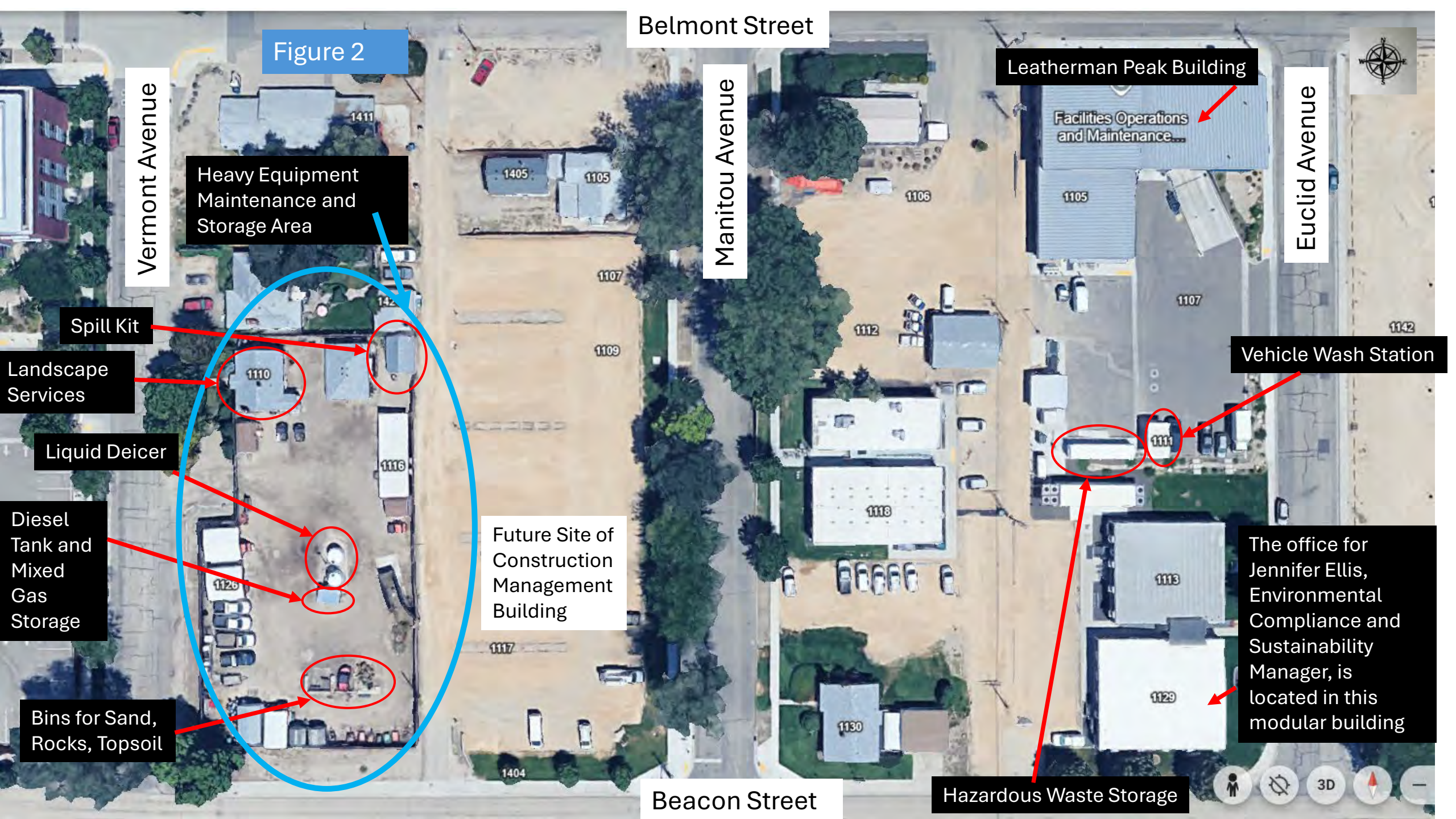


Figure 2

Belmont Street

Leatherman Peak Building

Euclid Avenue

Vermont Avenue

Manitou Avenue

Beacon Street

Heavy Equipment Maintenance and Storage Area

Spill Kit

Landscape Services

Liquid Deicer

Diesel Tank and Mixed Gas Storage

Bins for Sand, Rocks, Topsoil

Future Site of Construction Management Building

Facilities Operations and Maintenance...

Vehicle Wash Station

The office for Jennifer Ellis, Environmental Compliance and Sustainability Manager, is located in this modular building

Hazardous Waste Storage

Figure 3



Appendix B – Facility Pollution Prevention BMPs

Idaho Department of Environmental Quality Catalog of Stormwater Best Management Practices

Can be found at <https://www2.deq.idaho.gov/admin/LEIA/api/document/download/14968>

Section 4: BMP Fact Sheets

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BMP 76: Storm Water System Cleaning
BMP 77: Outdoor Storage
BMP 78: Fertilizer Management
BMP 79: Pesticide Management
BMP 80: Building and Grounds Maintenance
BMP 82: Equipment Yard Design Features
BMP 83: Vehicle and Equipment Refueling
BMP 84: Vehicle and Equipment Cleaning, Maintenance & Repair
BMP 86: Non-storm water Discharges to Drains
BMP 91: Employee Training

Idaho Catalog of Storm Water Best Management Practices



State of Idaho
Department of Environmental Quality
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Prepared by

Idaho Department of Environmental Quality
Water Quality Division
1410 N. Hilton
Boise, ID 83706



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BMP 15: Oil and Water Separators

Description

Hydrocarbons, oils/fats and grease, and other light nonaqueous phase liquids are common contaminants in storm water that have negative impacts to receiving waters and should be removed. Oil and water separators are designed to remove hydrocarbons from storm water runoff. Baffle and coalescing plate separators are two multichambered design configurations for these separators. Oil and water separators may include hydrocarbon filters inserted into a secondary chamber before outflow to adsorb dissolved and fine/unsettleable constituents (Figure 40).



Figure 40. Oil and water separator with coalescing plate separators to remove hydrocarbons (*Mohr Separations Research, Inc.*).

Baffle oil and water separators, also known as American Petroleum Institute (API) separators, are long multichambered vaults separated with baffles designed to remove gross amounts of sediment and hydrocarbon loadings from urban runoff. Large API separators may include sophisticated mechanical equipment for removing oil from the surface and settled solids from the bottom.

Coalescing plate (CP) separators include a series of parallel inclined plates that encourage separation of materials of different densities by attenuating inflow velocity and enabling agglomeration of dispersed nonaqueous particles. The plates are typically made of fiberglass or polypropylene and are closely spaced to improve the hydraulic conditions in the separator and promote oil removal. Another coalescing method uses a filter made of oleophilic (oil-loving) fibers in lieu of plates.

Applicability

Oil and water separators can be used where potential hydrocarbon contamination is a concern, such as in industrial sites, construction sites, fuel depots, or high traffic areas like multifamily dwellings, apartment complexes, gas stations, or

Primary BMP Functions and Controls

☐ Construction	☒ Permanent
☐ Erosion Control	☒ Sediment Control
☒ Source Control	☐ Flood Control
☒ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- ☐ Sediment
- ☐ Nitrogen
- ☐ Phosphorus
- ☒ Metals
- ☐ Bacteria
- ☒ Hydrocarbons
- ☒ Litter

Other BMP Considerations

Relative Cost	\$\$
Maintenance Requirements	High
Ease of Installation	Medium
Freeze/Thaw Resistance	Fair
Max. Tributary Drainage Area	12 acres
Max. Upstream Slope	15%
NRCS Soil Group	ABC
Min. Ground Water Separation	8 feet
Min. Bedrock Separation	8 feet

parking lots. These separators are often used in urban areas where land requirements and cost prohibit the use of larger BMPs or where tank farms are located to treat outflow from secondary containment structures.

Depending on loading conditions, oil and water separators can be located off-line from the primary conveyance/detention system and can be used for pretreatment of runoff before discharge to other BMPs.

Limitations

Relatively short retention times, as compared to other storm water BMPs, may limit pollutant removal capabilities. A sediment basin is recommended upstream of the oil and water separator to prevent sediment from entering the separator and the resuspension of sediment within the separator during periods of high flow.

Oil and water separators should not discharge directly into receiving water bodies, such as streams, if oils have become dissolved or emulsified or if there is the possibility of a petroleum hydrocarbon spill. Dissolved or emulsified substances may include coolants, soluble lubricants, glycols, and alcohols. Further treatment using BMPs, such as grass swales, is recommended downstream of oil and water separators.

Design Basis

The following design parameters apply to all three separator types:

- Appropriate removal covers should be provided to allow access for observation and maintenance.
- Storm water from building rooftops and impervious surfaces are not likely to be contaminated by oil and should not be discharged to the separator.
- Any pump mechanism should be installed downstream of the separator to prevent oil emulsification.
- Sediment loading to the oil and water separators should be minimized to reduce maintenance needs and improve system performance. Practice nonstructural BMPs, such as dry cleanup, to minimize solids flow to separators.

Additional requirements for API and CP separators:

- Separators should be sized for the water quality design storm specified by the local jurisdiction or one-third of a 2-year event if water quality design storm is not specified. Design storm information is presented in section 3.6.3.
- Separators should have a forebay to collect floatables and large settleable solids. Its surface area should be at least 20 square feet per 10,000 square feet of area draining to the separator.

The following are additional requirements for CP separators:

- Coalescing plates should not be spaced less than 3/4 inch apart.
- The angle of the plates should be from 45 to 60 degrees from horizontal.
- Absorbent pillows may be used in separators. Place API and CP-type separators in an afterbay. With the CP separator, absorbent materials should be placed in the manhole/vault.

Used absorbent pillows must be properly disposed of, and hazardous components must be considered before disposal (e.g., metal concentrations exceeding toxicity characteristic leaching procedure limits).

- Add pretreatment for sediment that could clog CP separators or otherwise impair the long-term effectiveness of the separator.

Sizing Procedure

Oil droplets exist in water in a wide distribution of sizes. Separators are designed to remove a range of all droplet sizes and greater to ensure that the device will achieve design removal efficiency and meet effluent standards (e.g., no visible oil sheen; fat, oil, and grease limits).

API separators (Figure 41) are usually sized to remove oil droplets 150 microns in size and larger. Smaller droplets rise so slowly that they would require a relatively large vault if removed using an API separator. CP separators (Figure 42) are more appropriate for smaller droplets and are commonly designed to remove 60 to 90-micron sizes and can be designed to remove oil droplets as small as 20 microns. Hydrocarbon filters can also be used for fine droplet impingement and dissolved fraction filtration.

Data are not available on the size distribution of dispersed oil in storm water from commercial or industrial land uses except for petroleum storage terminals. The data indicate that, by volume, about 80% of the droplets are greater than 90 microns in size. Less than 30% are greater than 150 microns. For these guidelines, both the API and CP separators are sized to remove 60 microns and larger droplets at a temperature of 10 °C giving a rise rate of 0.033 feet per minute (10 millimeters per minute). The large size requirement for treatment of 60-micron and smaller-sized droplets may preclude the use of API separators.

API Separator Sizing

For oil droplets that average 60 microns in size, API separators can be sized using these general guidelines:

- Horizontal velocity, V_h : 3 feet per minute or 15 times the rise rate, V_t (API criteria), whichever is smaller (rise rate of 0.033 feet per minute for average 60-micron size V_b , oil droplets). V_t can also be determined on a site-specific basis using Stoke's law or determined from empirical equations. For drainage areas less than 2 acres, the design hydraulic velocity, V_h , can be used for the ratio V_h/V_t rather than the API minimum of $V_h/V_t = 15$. However, performance verification of this design basis should be obtained during at least one wet season (Washington State Department of Ecology 2012).
- Depth of 3 to 8 feet
- Depth-to-width ratio of 0.3 to 0.5
- Width of 6 to 20 feet
- Baffle height-to-depth ratios of 0.85 for top baffles and 0.15 for bottom baffles (Figure 41).

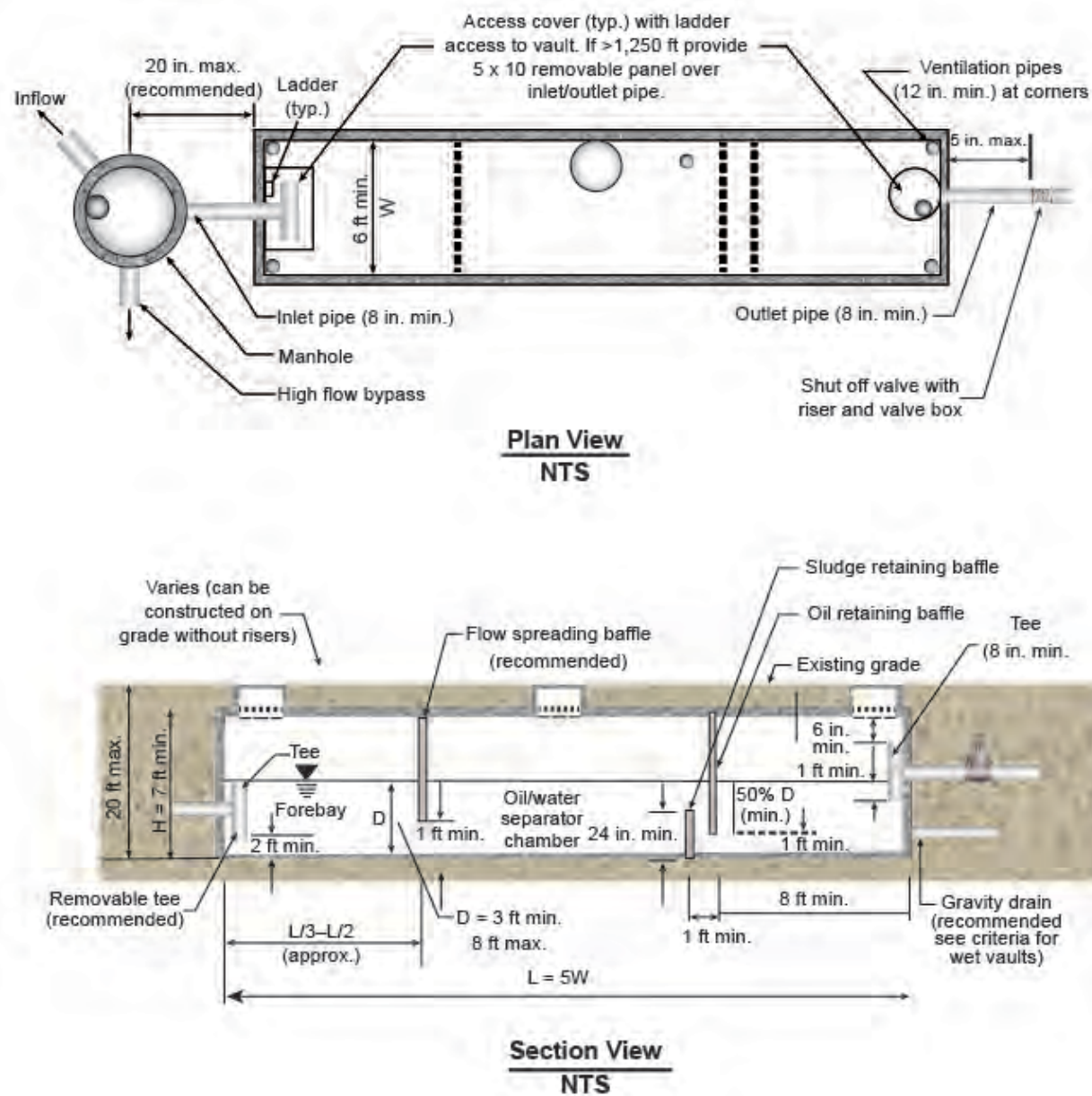
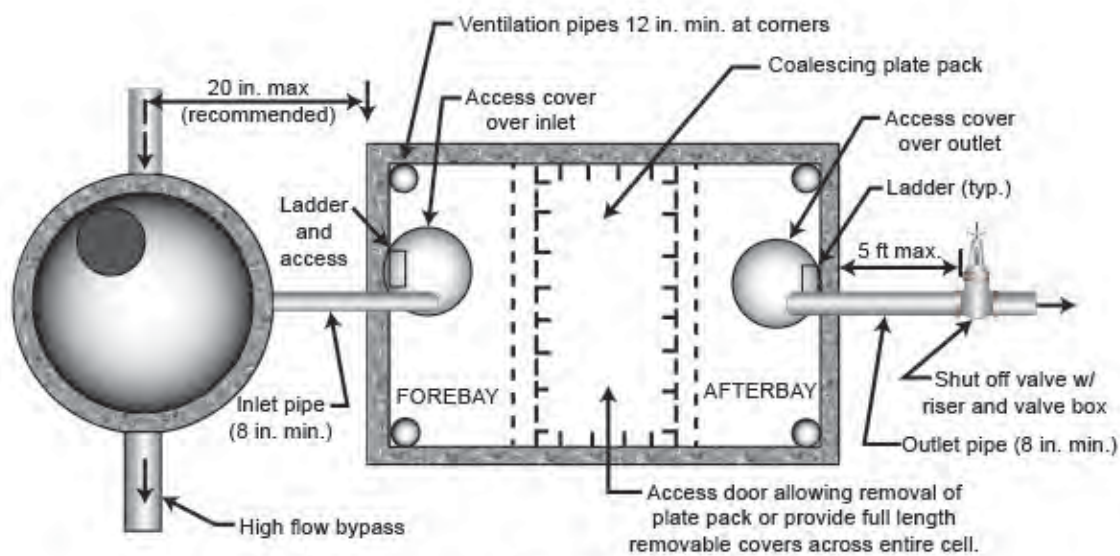
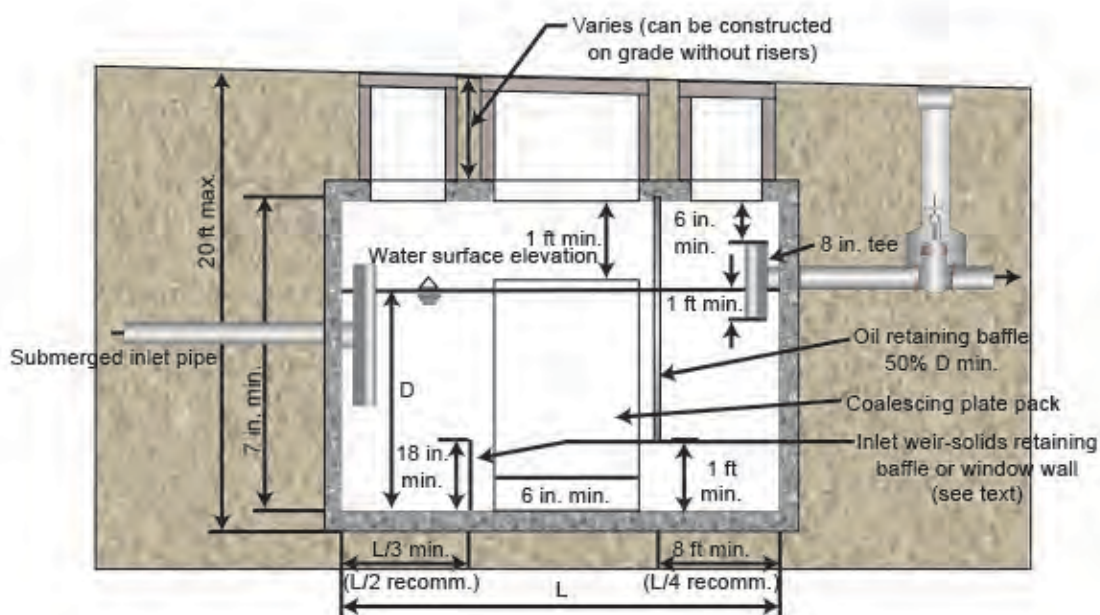


Figure 41. API separator.



PLAN VIEW
NTS



SECTION VIEW
NTS

Figure 42. CP separator (King Country 2009).

The separator can be first sized for depth using Equation 18:

$$d = \left(\frac{Q}{2V_h} \right)^{1/2} \quad \text{Equation 18. Depth sizing.}$$

Where

Q = design flow

V_h = design horizontal velocity = 15 V_t

V_t = rise rate = 0.033 feet per minute for 60-micron oil or determined

Calculate the width using the ratios above (i.e., 0.3 to 0.5 depth-to-width ratio). Then calculate length of the separator section using Equation 19:

$$L_s = d \frac{V_h}{V_t} F \quad \text{Equation 19. Separator length.}$$

$$L = L_s + L_f + L_a$$

Where

L_s = length of the separator section

L_f = length of the forebay = $L/2$ to $L/3$

L_a = length of the afterbay = $L/4$, 8-foot minimum

L = total length = $L_s + L_f + L_a$

F = turbulence and short-circuiting factor (Figure 43)

CP Separator Sizing

Calculate the projected (horizontal) surface area of plates required using Equation 20:

$$A_h = \frac{Q}{V_t} \quad \text{Equation 20. Coalescing plate area.}$$

Where

A_h = horizontal surface area of the plates (square feet)

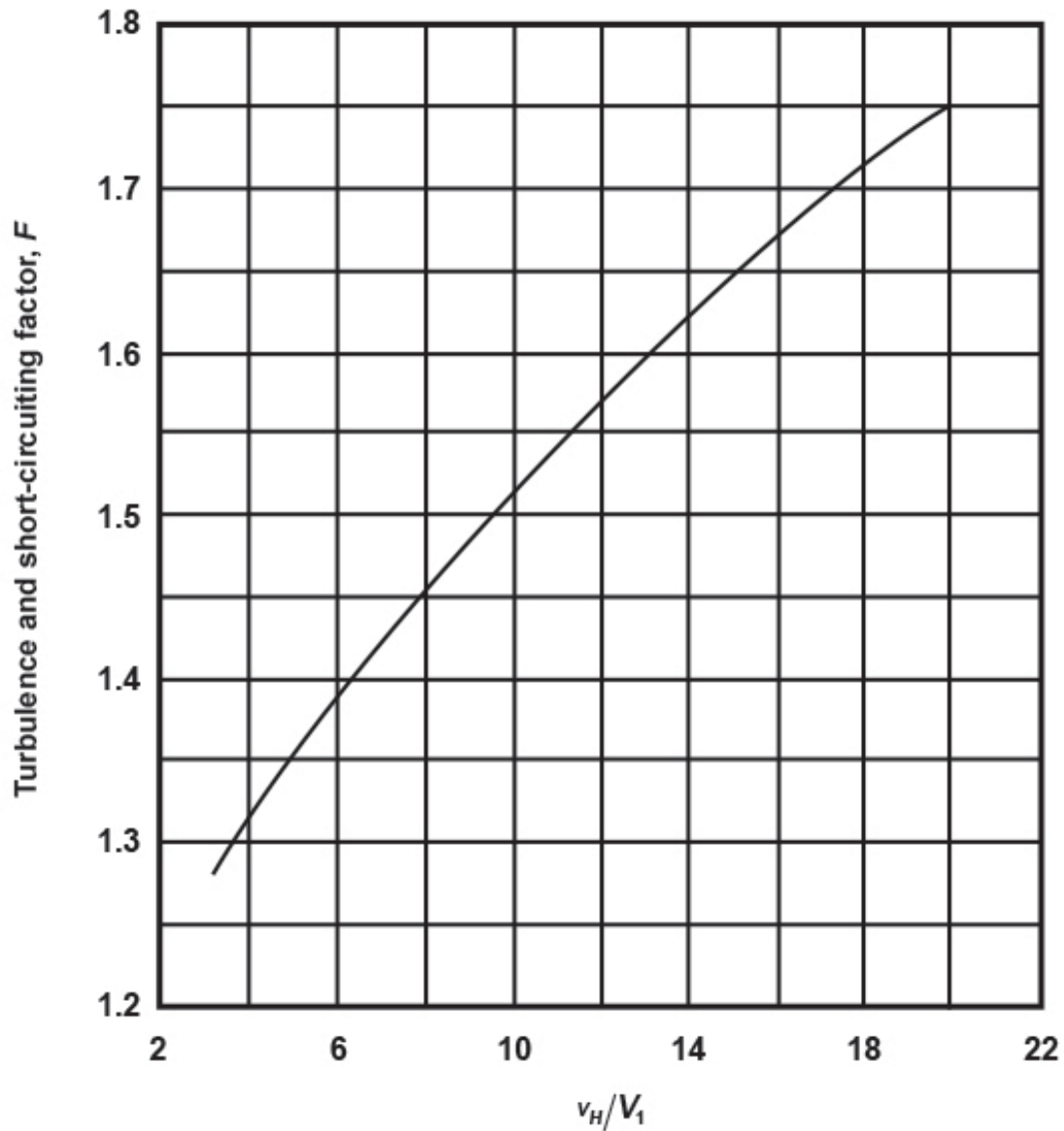
Q = design flow rate (cubic feet per minute)

V_t = rise rate of the oil droplet (feet per minute [ft/min]) = 0.033 ft/min for 60-micron oil droplets

Refer to the manufacturer's recommendations for oil and water separator sizing. Manufacturers of plate packs provide standard size packages that are rated at a particular flow (usually gallons per minute). However, if the manufacturer's flow rating is for conditions different than used above, the engineer should compare the plate surface area with the above calculation. Do not confuse projected plate area with actual plate area.

The width, depth, and length of the plate pack and the chamber in which the plate pack is placed is completely flexible and is a function of the plate sizes provided by the particular pack manufacturer and standard size vaults that are available for small sites.

Additional design and sizing details for both baffle and CP separators are provided in the [King County, Washington, Surface Water Design Manual](#) (King County 2009)



v_H/V_1	Turbulence Factor (F_1)	$F = 1.2(F_1)$
20	1.45	1.74
15	1.37	1.64
10	1.27	1.52
6	1.14	1.37
3	1.07	1.28

Figure 43. Turbulence and short-circuiting factor (API 1990).

Construction Guidelines

- The installation of proprietary systems such as the API or CP separator systems discussed above must follow manufacturer's construction standards and procedures.
- When installing CP packs in CP separator units, take care to avoid deforming the plates.
- Oil and water separators should be cleaned and flushed before operation.
- Underground tanks should be analyzed for buoyancy, especially if local hydrology increases the risk of floating the vault during periods of high ground water and/or storm events. The system may need to be anchored or ballasted in place according to the manufacturer's standards and recommendations.

Maintenance

- Oil and water separators should be inspected frequently and cleaned as necessary to keep accumulated oil from escaping during storms. As a rule of thumb, they should always be cleaned in the fall to remove material that has accumulated during the dry season, after leaf drop, and again after a significant storm.
- During the first few years of operation, oil and water separators should be inspected according to manufacturer's guidelines, after each storm event, or more frequently depending on site-specific conditions to ensure oil and sediment buildup have not exceeded design depths, the unit is free of litter and other obstructions, and to confirm proper function according to the manufacturer's specifications.
- Oil absorbent pads are to be replaced as needed but should always be replaced in the fall before the wet season and in the spring.
- Construction period inspections should be conducted as required by both the NPDES permit and manufacturer's specifications.
- The effluent shutoff valve is to be closed during cleaning operations.
- Waste oil and residuals should be disposed of according to current DEQ, local government, and health district requirements.
- Any standing water removed during the maintenance operation should be disposed of to a municipal or industrial sewer system at a discharge location approved by the local government.
- Any standing water removed should be replaced with clean water to prevent oil carry-over through the outlet weir or orifice.

Additional Resources

API (American Petroleum Institute). 1990. *Monographs on Refinery Environmental Control - Management of Water Discharges (Design and Operation of Oil-Water Separators)*. 1st ed. Publication 421. Washington, DC: API.

EPA (US Environmental Protection Agency). 1999. *Stormwater Technology Fact Sheet: Water Quality Inlets*. Washington, DC: Office of Water. EPA 832-F-99-029.

ITD (Idaho Transportation Department). 2014. *Best Management Practices*. Boise, ID: ITD.

King County (King County, Washington). 2009. *King County, Washington Surface Water Design Manual*. Seattle, WA: King County, Department of Natural Resources.
<http://your.kingcounty.gov/dnrp/library/water-and-land/stormwater/surface-water-design-manual/SWDM-2009.pdf>

Washington State Department of Ecology. 2009. *Stormwater Management Manual for Western Washington*. Lacey, WA. Publ. 12-10-030.
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

BMP 16: Centrifugal or Vortex-Separation Structures

Description

Centrifugal separation structures, also known as hydrodynamic or vortex separators, are underground structures that use tangential forces created by the incoming flow of storm water to separate trash, debris, oil, and other pollutants from storm water runoff. These separators are designed with internal components that impart a swirling motion to water entering the device. Separation is accomplished by water entering a cylindrical chamber on a tangential plane that creates a vortex. The flow at the outer edge of the tank moves at a slightly higher velocity than the flow at the center, and, as a result, denser, heavier material moves downward to the center and lighter, floatable materials rise to the surface on the outside (Figure 44).



Figure 44. Inside view of Kristar 48-inch dual vortex separator (City of Watsonville, CA).

Additional compartments or chambers trap oil and other floatables. These systems may include a wall to separate TSS from oil and a bypass weir to allow excess flows to bypass the system and prevent the unit from flooding or losing its captured material. Vortex separators do not have any moving parts.

Applicability

These systems are ideal in highly urbanized areas because they are space efficient and can be placed under parking lots or installed as a manhole junction box or inlet structure. The systems are most effective when the runoff materials to be removed are heavy particulates, which can be settled, or floatables, which can be skimmed or screened out. These structures are recommended for the following applications:

- Pretreatment for other BMPs
- Retrofit of existing development or redevelopment
- Dense urban development areas
- Storm water hotspot

Primary BMP Functions and Controls

☐ Construction	☒ Permanent
☐ Erosion Control	☒ Sediment Control
☒ Source Control	☐ Flood Control
☒ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- Sediment
- Phosphorus
- Metals
- Bacteria
- Hydrocarbons
- Litter

Other BMP Considerations

Relative Cost	\$\$\$
Maintenance Requirements	Medium
Ease of Installation	Med-Hard
Freeze/Thaw Resistance	Fair
Max. Tributary Drainage Area	Varies
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Limitations

Vortex separators are not effective at removing dissolved pollutants or pollutants that adhere to fine particles, such as nutrients. Performance can be compromised during low flows as a swirl action is most effective when the inlet pipe is carrying full pipe flow. Site constraints, including the availability of suitable land, appropriate soil depth, and stable soil to support the unit structurally, may also limit the applicability of hydrodynamic separators. The slope of the site or collection system may necessitate using an underground unit, which can result in an extensive excavation.

Design Basis

Criteria should be obtained from the manufacturer to ensure that the correct design and sizing criteria are used in selecting the appropriate system for a particular site. In general, the flow-through configuration and treatment limitations will force drainage areas to remain relatively small. Currently, units are available from a number of manufacturers in sizes ranging from 3 to 40 feet in diameter with processing capacity from 1.6 to 300 cubic feet per second. Some units are small enough to fit into conventional manholes.

The system should be sized for the water quality design storm. If the system is too large, it will not have the volume/velocity relationship to achieve the swirl action. For storms greater than the water quality design storm, an overflow, or bypass, should be used to divert storm water to an appropriately sized storage facility with a sedimentation basin or other BMP for treatment.

Construction Guidelines

Vortex separators should be installed according to manufacturer's instructions and specifications.

Maintenance

This system requires regular inspection and maintenance to maximize effectiveness. The specific maintenance requirements and schedule should be prepared by the manufacturer and signed by the owner/operator. The frequency of maintenance not only depends on the type of manufactured system chosen but also the pollutant load from the contributing drainage area.

In general, frequent inspections after every storm or every 30 days are recommended during the first year after installation and whenever heaving contaminant load occurs, such as after winter sanding or soil disturbances. Deposition can be measured with a calibrated dip stick, and sediment should be removed by vacuum pumping when the unit is filled to within 1 foot of capacity. Remove floatables and clean screens when needed. The frequency of inspections can be adjusted after the first year based on observed sediment accumulation rates.

Additional Resources

EPA (US Environmental Protection Agency). 1999. *Storm Water Technology Fact Sheet: Hydrodynamic Separators*. Washington, DC: Office of Water. EPA 832-F-99-017. http://water.epa.gov/scitech/wastetech/upload/2002_06_28_mtb_hydro.pdf.

BMP 43: Dust Control

Description

Dust control and wind erosion prevention BMPs keep soil particles from entering the air as a result of land-disturbing construction activities by protecting the soil surface, roughening the surface, and/or reducing the surface wind velocity (Figure 113).

Dust control practices apply to either disturbed graded areas or construction roadways. For disturbed graded areas, practices such as seeding or sodding (BMP 32), mulching (BMP 52), using soil binders (BMP 55), sprinkling, surface roughing (BMP 58) or practices that provide prompt surface cover can be used. For construction roadways, practices such as using a stabilized surface (BMP 41), sprinkling, or using chemical dust tackifiers are options. Wind barriers can control wind currents and minimize the amount of dust transported into air and water.

Applicability

Use control measures on any construction site where the potential exists for air or water pollution from dust, especially when open, dry areas of soil are anticipated on site and where heavy construction activity such as clearing, grading, excavation, demolition, or excessive vehicle traffic takes place. Dust control is especially important in regions experiencing long periods without rain and during the summer when soil can become dry and vulnerable to transport by wind. In many cases, water erosion control measures incorporated into the project will indirectly prevent wind erosion.

Limitations

Vegetative dust control measures may not be practical during dry periods without a reliable supply of establishment water. Other methods should be stipulated in the project contract to ensure that dust control is not overlooked.



Figure 113. Sprinkling water for dust control on a pathway construction project, Driggs, Idaho.

Primary BMP Functions and Controls

☒ Construction	☐ Permanent
☒ Erosion Control	☐ Sediment Control
☐ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

●	Sediment
○	Phosphorus
◐	Metals
○	Bacteria
◐	Hydrocarbons
○	Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Medium
Ease of Installation	Easy
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Wind barriers (such as walls or fences) can be part of the long-term dust control strategy in arid and semiarid areas, but they are not a substitute for permanent stabilization.

Chemically treated subgrades may make the soil water repellent, interfering with long-term infiltration and vegetation/revegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents that must be handled properly.

Overwatering may cause erosion and wash sediment or other constituents into the drainage system.

Design Basis

Develop a dust control plan before construction. The plan should evaluate the site with potential dust emission sources identified, provide a selection of dust control methods for each area of the site, determine the maintenance needed, and monitor the effectiveness of the selected dust control measures. The site evaluation should consider the soil type, prevailing wind direction, and effects of other prescribed erosion control measures.

Dust Prevention

The best method of controlling dust is to prevent dust production:

- **Minimize the surface area disturbed**—By limiting the amount of bare soil exposed at one time, less ground is disturbed, less dust is raised while working, and less cleanup is required when work is done. During project design, identify areas where ground disturbance will not be allowed and fence or provide signage during construction. Design and locate haul roads, detours, and staging areas to avoid unnecessary exposure of bare ground.
- **Limit dusty work on windy days**—Minimize amount of ground disturbance occurring when potential for wind erosion is highest. Apply dust suppression measures when needed. Monitor dust suppression efforts to ensure dust emissions are adequately controlled. Depending on weather conditions, adjust to fewer or more frequent application intervals.
- **Clean up dusty spills immediately**—Do not wait for the next scheduled housekeeping; the mess will just get bigger and cleanup will take longer.
- **Plan ahead to limit dust**—Avoid using areas most susceptible to wind erosion. In the storm water site plan, specify staging or work-sequencing techniques that minimize the risk of wind erosion from bare soil. In most cases, a change will be required from traditional construction techniques that allow large areas to be disturbed at the outset of construction and remain exposed for long periods of time.

Graded Areas

Clearing and grading activities create the opportunity for large amounts of dust to become airborne. Stabilize graded areas as soon as practicable after disturbance and do not leave open areas uncovered. The following practices can help with dust control in graded areas:

- **Grow vegetative ground cover**—Exposed areas that are not being paved should be stabilized using vegetation and landscaping (BMP 32) to prevent wind and water erosion. When rainfall is insufficient to establish vegetative cover, mulching (BMP 52) conserves

moisture, prevents surface crusting, reduces run-off erosion, and helps to establish vegetation. It is a critical treatment on sites with erosive slopes.

- **Use wind barriers**—Barriers prevent erosion by obstructing the wind near the ground and preventing the soil from blowing off site. Wind, snow, or silt fences or similar barriers are temporary measures that can reduce wind velocity. Perennial grass, bushes, stands of trees, rock walls, wooden board fences, or earthen banks are more permanent measures that can serve as wind barriers. A wind barrier generally protects soil downwind for a distance of 10 times the height of the barrier. If additional protection is needed, use other methods with the barrier.
- **Surface roughening**—Deep tillage in large open areas brings soil clods to the surface where they rest on top of dust, preventing it from becoming airborne. Tilling or disking should leave 6-inch (minimum) furrows, preferably perpendicular to the prevailing wind direction, to gain the greatest reduction in wind erosion. If the surface cannot be furrowed perpendicular to the prevailing wind direction, roughening the surface by using a ripper/scarifier (grader) or a ripper (cat) will produce the desired result of a 6-inch irregular surface. BMP 58: Slope Roughening provides more information.

Construction Roadways and Storage Areas

Temporary construction roads and storage areas should be stabilized using recommendations in BMP 42: Erosion Prevention on Construction Roads to minimize the amount of dust generated by construction vehicles. Other recommendations for dust control on construction roadways and storage areas include the following:

- **Water and/or sweep often**—Sprinkle the site with water until the surface is wet. Apply at a rate of 3 gallons per acre so that the soil is wet but not saturated or muddy and so that no dust is being generated. To ensure vehicle traffic is not picking up dust from wind action and carryout, water and sweep roadways often. Fewer treatments are necessary in cool, wet weather.
- **Spray-on chemical soil treatments (palliatives)**—Spray-on soil binders form a bond between soil particles keeping them grounded. Chemicals include mineral salts, petroleum resins, asphalt emulsion, acrylics, and adhesives. These treatments must be reapplied periodically to ensure continued effectiveness. Chemical tackifiers should only be used on mineral soils, and the chemicals should not create any adverse effects on storm water, plant life, surface water, or ground water. Check with DEQ to ensure the material to be applied is not harmful and may be used for this purpose.
- **Reduce speed limits**—Reduce speed limits on unpaved surfaces to 10 to 15 miles per hour for well-traveled areas and heavy vehicles. Never exceed 25 miles per hour for any vehicle on any unpaved surface.
- **Prevent transport of dusty material off site**—Minimize transport of dusty material off site by rinsing vehicles before they leave the property, tightly cover loaded trucks, and provide stabilized construction roads and staging areas (BMP 41).
- **Enclose storage and handling areas**—If dusty materials are frequently loaded and unloaded in storage and handling areas, enclose the areas to reduce dust production. Use storage silos, three-sided bunkers, or open-ended buildings. If handling is less frequent, try wind fencing. Conveyor loading may require enclosure or the use of water or foam spray bars both above and below the belt surface to reduce emissions.

- **Keep storage piles covered**—When storage piles are not in use, apply a physical cover or a dust suppressant spray to reduce dust emissions. Limit the working face of the pile to the downwind side. Most emissions come from loading the pile, loadout from the pile, and truck and loader traffic in the immediate area if the pile is batch loaded. Keep the drop height low to reduce dust and the ground at the base of the pile clear of spills.

Construction Guidelines

Dust control measures should be considered and selected before clearing and grading activities. During construction, monitor dust control activities on a regular basis to ensure the measures taken are adequately preventing airborne dust from leaving the site.

Maintenance

Dust control requires constant attention: it is not a one-time or once-in-awhile activity. Dust control sprinkling may have to be done several times a day during hot, dry weather.

Areas protected by mulch, adhesive emulsions, or barriers need to be checked at regular intervals according to the inspection schedule in the storm water plan.

Apply spray-on chemical treatments using the manufacturer's specified rates and according to all federal, state, and local regulations. Chemical products should be stored, handled, and disposed of according to all applicable local and state regulations and policies.

Additional Resources

DEQ (Idaho Department of Environmental Quality). 2013. *Controlling Fugitive Dust at Construction Sites*. Boise, ID: DEQ.

EPA (US Environmental Protection Agency). 2014. *Dust Control*. Water: Best Management Practices. <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>

BMP 44: Stockpile Management

Description

Stockpile management procedures and practices reduce or eliminate air and storm water pollution from stockpiled erodible materials, such as soil, sawdust, landscaping bark, compost, sand, fly ash, stucco, hydrated lime, Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, aggregate subbase, premixed aggregate, asphalt minder (or *cold mix* asphalt), and pressure-treated wood. Raw material stockpiles can easily erode during storm events and contribute suspended solids, nutrients, metals, and pH changes to storm water runoff (Figure 114).



Figure 114. Covered stockpile (ITD 2014).

Applicability

Implement stockpile management on all construction sites that stockpile and store erodible materials or have land-clearing debris composed, in whole or in part, of sediment or soil.

Limitations

Covering alone may not protect exposed materials from contact with storm water runoff and run-on. Using plastic sheeting to cover stockpiles can increase runoff volume and rates and potentially cause failure of sediment controls placed around the stockpile's perimeter. In extremely windy areas, tarpaulins and sheeting may require additional weights or securing.

Design Basis

Location

Locate stockpiles a minimum of 50 feet away from concentrated storm water flows, drainage courses, and inlets and outside of any natural buffers (BMP 2) and in areas that will remain undisturbed for the longest period of time as construction progresses.

Do not place stockpiles in streets or paved areas unless no other practical alternative exists.

Primary BMP Functions and Controls

☒ Construction	☐ Permanent
☒ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

●	Sediment
◐	Phosphorus
◑	Metals
○	Bacteria
○	Hydrocarbons
◐	Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Low
Ease of Installation	Easy
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Covering

Covering prevents storm water from coming into contact with potential pollutants, minimizes sediment discharge, and reduces material loss from blowing wind. Covering is a simple, effective, and inexpensive way to reduce or prevent pollution from stockpiles. Materials used as stockpile covers include tarpaulins, plastic sheeting, and pervious fabrics; mulches (BMP 52), vegetation (BMP 32), or soil binders (BMP 55) can be used for soil stockpiles that will be in place for longer periods of time.

Plastic sheeting with nylon reinforcement can be more durable than standard sheeting; avoid sheeting made of photodegradable plastics. Due to the relatively rapid breakdown of most polyethylene sheeting, it is unsuitable for applications over 6 months.

Sediment Control

Place a temporary sediment control barrier around the stockpile's perimeter to protect it from storm water run-on from the site and the site from runoff from the stockpile. Perimeter control barriers such as berms (BMP 70), dikes (BMP 69), fiber rolls (BMP 64), silt fences (BMP 65), or biofilter bags (BMP 63) can be used. For stockpiles located on paved areas, rock socks are recommended for perimeter control, and all inlets with the potential to receive sediment from the stockpile should be protected (BMP 74: Inlet Protection).

Implement dust and wind erosion control practices as appropriate on all stockpiled material. Place bagged materials on pallets and under cover.

Accumulated sediment on pavement or other impervious surfaces should not be hosed down or swept into any storm water conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water.

Nonactive Stockpile Protection

Nonactive stockpiles of the following materials should be protected as follows:

Soil stockpiles—Cover soil stockpiles or protect with soil stabilization measures and a temporary perimeter sediment barrier at all times. Unless permit requirements or other local regulations specify otherwise, soil stockpiles should be covered or stabilized within 14 days after the stockpile is placed or sooner if site conditions, such as highly erodible soils or expected rainfall, warrant. For site discharges to impaired waters, complete stabilization activities within 7 calendar days.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate subbase—Cover and protect stockpiles with a temporary perimeter sediment barrier at all times.

Stockpiles of cold mix—Place cold mix stockpiles on and cover with plastic sheeting, or a comparable material, at all times and surround covered stockpile with a berm.

Stockpiles/storage of pressure-treated wood—Cover pressure-treated wood with plastic sheeting or comparable material at all times and surround with a berm.

Stockpiles of fly ash, stucco, and hydrated lime (basic materials)—At all times, cover stockpiles of materials that may raise the pH of runoff with plastic sheeting and surround with a berm.

Active Stockpile Protection

For actively used stockpiles, the perimeter sediment control barrier should have a stabilized designated access point on the upgradient side of the stockpile. Divert runoff around or away from the stockpile on the upstream side of the stockpile.

Cover all actively used stockpiles before the onset of precipitation. Stockpiles of *cold mix*, treated wood, and basic materials should be placed on and covered with plastic sheeting or a comparable material and surrounded by a berm before the onset of precipitation.

Construction Guidelines

Stockpiles should be protected immediately if they are not scheduled to be used within 14 days of placement.

To cover stockpiles with tarpaulins or plastic sheeting, obtain enough fabric or sheeting to cover the indicated volume or area. Anchor the edges of the covering with stakes, tie-down ropes, large rocks, tires, or other readily available, heavy objects. Maintain an overlap of 3 feet along the borders and securely anchor the overlap area so that it does not separate (by wind or other causes).

Maintenance

During the rainy season, inspect the stockpile BMPs weekly before forecasted rain events, daily during extended rain or high wind events, and after the rain or high wind events end. During the nonrainy season, inspect BMPs every 2 weeks. Make any necessary repairs after inspection.

Repair and/or replace perimeter controls and covers as needed to keep them functioning properly. Sediment should be removed when it reaches one-third of the barrier height.

Frequently inspect coverings for damage and general wear. Repair or replace coverings immediately, or as needed. Inspect plastic sheeting more frequently during periods of high winds or extreme heat.

Additional Resources

CASQA (California Stormwater Quality Association). 2015. “Stockpile Management.” *California Stormwater Best Management Practices Handbook: Construction*. Menlo Park, CA.
<https://www.casqa.org/resources>

ITD (Idaho Department of Transportation). 2014. “Stockpile Management.” *Best Management Practices*. Boise, ID: ITD.
<https://apps.itd.idaho.gov/apps/env/BMP/PDF%20Files%20for%20BMP/Chapter%204/W-M-4%20Stockpile%20Management.pdf>

BMP 46: Spill Prevention and Control

Description

A spill prevention and control plan includes procedures for preventing spills of hazardous waste and methods for handling and cleaning up spills (Figure 116). Numerous spill containment methods range from large structural barriers to simple, small drip pans. The benefits vary based on cost, maintenance requirements, and the size of spill control.

Applicability

Develop a spill prevention and control plan for any construction site where hazardous wastes are stored or used. Hazardous wastes include pesticides, paints, cleaners, petroleum products, fertilizers, deicing materials, and solvents.

Limitations

Some sites may also be subject to the oil pollution regulations specified in 40 CFR 112 and CWA §331, and required to develop a Spill Prevention Control and Countermeasure (SPCC) plan. Check with federal, state, and local agencies that may also have applicable regulations that must be adhered to.

Design Basis

Address the following elements in a spill control and response plan.

Spill Prevention

Prevention is the first line of defense in protecting storm water runoff from contamination due to spills and leaks:

- Use recycled, reclaimed, or reused materials where possible to reduce the amount of new material needed. Substitute less or nontoxic materials for toxic materials.



Figure 116. Collapsible wall containment berm ([The Spill Source](#)).

Primary BMP Functions and Controls

☒ Construction	☐ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- | |
|---|
| ☐ Sediment |
| ☐ Phosphorus |
| ☒ Metals |
| ☐ Bacteria |
| ☒ Hydrocarbons |
| ☐ Litter |

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Medium
Ease of Installation	Easy
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

- Routinely maintain and check the condition of containers holding hazardous waste, and replace containers that are leaky, corroded, or otherwise deteriorating.
- Label all containers according to their contents. Educate all employees on how to prevent spills and how to clean up if a spill occurs. All employees should be able to recognize and report illegal dumping incidents.

Spill Control and Containment

Identify potential spill source locations such as loading and unloading areas, materials storage areas, processing areas, and waste disposal areas. Containment methods include diking, curbing, and drip pans. If a spill occurs, adequately control and contain the spill to prevent contaminating surface water or ground water.

Containment diking consists of temporary or permanent berms or retaining walls designed to hold spills. Diking is one of the best protective measures against storm water pollution because it surrounds the area of concern and keeps spill materials separated from the storm water outside of the diked area (BMP 69: Diversion Dike and BMP 70: Temporary Berms).

Diking is commonly used for controlling large spills or releases from liquid storage and transfer areas because it is an effective containment method around tank truck loading and unloading areas. The size of a containment dike system for tank truck loading and unloading operations should be capable of holding a volume equal to any single tank truck compartment plus some amount of freeboard to ensure that discharge from the secondary containment area will not occur.

Materials used to construct the dike should be strong enough to safely hold spilled materials. The materials used usually depend on what is available on site and the substance to be contained. Dikes may be made of earth (i.e., soil or clay), concrete, synthetic materials (liners), metal, or other impervious materials. Containment dikes may need to be designed with impervious materials to prevent leaking or pollution of storm water, surface water, and ground water supplies.

In general, strong acids and bases may react with metal containers, concrete, and some plastics. Where spills may consist of these substances, consider other alternatives. More reactive organic chemicals may also need to be contained with special liners. If uncertain about the suitability of certain dike construction materials, refer to the Material Safety Data Sheet (MSDS) for the chemical being contained.

Curbing, like containment diking, is a barrier that surrounds an area of concern and prevents spills or leaks from being released to the environment by routing runoff to treatment or control areas. The terms *curbing* and *diking* are sometimes used interchangeably, but curbing is usually small scale and cannot contain large spills like diking. Common materials used for curbing include earth, concrete, synthetic materials, metal, or other impenetrable materials. Asphalt is also a common material used in curbing. Curbing is inexpensive, easy to install, and provides excellent control of run-on. As with diking, materials spilled within a curbed area can be collected for proper disposal and/or recycling.

When using curbing for runoff control, protect the curb by limiting traffic and installing reinforced curbs in areas of concern. Materials spilled within a curbed area can be tracked outside of that area when personnel and equipment leave the area. This tracking can be minimized by grading within

the curbing to direct the spilled materials to a downslope side of the curbed area, keeping the materials away from personnel and equipment that pass through the area. It will also allow the materials to accumulate in one area and make cleanup much easier. Manual or mechanical methods, such as those provided by sump systems, can be used to remove accumulated material from a curbed area.

Drip pans are used to contain very small volumes of leaks, drips, and spills. Drip pans can be depressions in concrete, asphalt, or other impenetrable materials or they can be made of metals, plastic, or any material that does not react with the dripped chemicals. Empty or discarded containers may be used as drip pans. Drip pans catch material or chemical drips that can be cleaned up easily or recycled before contacting storm water. Drip pans can be a temporary or permanent measure.

Use drip pans at any site where valves and piping are present and the potential exists for small-volume leakage and dripping. Although leaks and drips should be repaired and eliminated as part of preventive maintenance programs, drip pans provide a temporary solution where repair or replacement is delayed. In addition, drip pans provide a safeguard when positioned beneath areas where leaks and drips may occur. Drip pans are inexpensive, easy to install, and simple to operate. They allow for reuse or recycling of the collected material.

When using drip pans, consider local weather conditions, the location of the drip pans, materials used for the drip pans, and how the pans will be cleaned. Drip pans should be inspected and cleaned frequently, so place them in areas that are easy to reach. Avoid placing drip pans in precarious positions such as next to walkways or on uneven surfaces. Drip pans in these locations are easily overturned and may present a safety or environmental hazard.

Weather is also an important factor. Heavy winds and rainfall can move or damage drip pans because the pans are small and lightweight. Secure the pans by installing or anchoring them to platforms, place behind wind blocks, or tie the pans down.

Cleanup and Disposal

Clean up spills or contaminated surfaces immediately using dry cleanup measures where possible and eliminating the source of the spill to prevent discharge or further discharge. Adequate supplies should be available at all times to handle spills, leaks, and disposal of used liquids from fueling and maintenance of equipment or vehicles. When cleaning up spills, follow MSDS guidelines to prevent unintentional chemical reactions.

If spilled materials are hazardous, the cleanup materials are also hazardous and must be disposed of properly. If the spill is large, a Hazmat team or private spill cleanup company may be necessary depending on permit requirements.

Reporting

Keep a record of any spills, including the date and time of the incident, causes, duration, response procedures, and persons notified. If a spill occurs, and it is not contained by the on-site containment methods, report it to the proper authorities. Federal regulations require that oil spills

into a navigable water or adjoining shoreline above a certain threshold must be reported to the National Response Center at (800) 424-8802. Oil spills must be reported in the following cases:

- Violate applicable water quality standards.
- Cause a film or *sheen* upon, or discolor, the surface of the water or adjoining shorelines.
- Cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

Spills should also be reported to local agencies, such as the fire department, if necessary to assist with cleanup.

Construction Guidelines

Spill prevention and containment measures should be employed as long as hazardous materials are stored on site. Key spill response personnel should be identified before the project starts, and all employees and subcontractors should be trained on spill prevention, response, and cleanup procedures.

Maintenance

Update the spill prevention and control plan when changes occur in staffing, to the site, or where the materials are stored. Regular inspections should be conducted to ensure proper procedures are posted and cleanup equipment is available. Guidelines for maintaining spill containment measures are provided below:

Containment dikes should be inspected during or after significant storms or spills to check for washouts or overflows. Regular testing is recommended to ensure that the dikes can hold spills. Soil dikes may need to be inspected on a more frequent basis.

Changes in vegetation, inability of the structure to retain storm water, dike erosion, or soggy areas indicate problems with the dike's structure. Damaged areas should be patched and stabilized immediately, where necessary. Earthen dikes may require special maintenance of vegetation, such as mowing and irrigation.

When evaluating the performance of the containment system, pay attention to the overflow system because it is often the source of uncontrolled leaks. If overflow systems do not exist, accumulated storm water should be released periodically. Polluted storm water should be treated before release. Mechanical parts (e.g., pumps) or manual systems (e.g., slide gates and stopcock valves) may require regular cleaning and maintenance.

Curbing is sized to contain small spill volumes, and frequent maintenance is needed to prevent overflow of any spilled materials. Inspect all curbed areas regularly and clean clogging debris. Repair the curb by patching or replacing it as needed to ensure effective functioning. Conduct inspections before forecasted rainfall events and immediately after storm events. If spilled or leaked materials are observed, start cleanup immediately to allow space for future spills. Prompt cleanup of spilled materials will prevent dilution by rainwater, which can adversely affect recycling opportunities.

Drip pan effectiveness depends on site operators paying attention and emptying the pans when they are nearly full. Because of their small holding capacities, drip pans easily overflow if not emptied. Recycling efforts can be affected if storm water accumulates in drip pans and dilutes the spilled material. Ensure clearly specified and easy to follow practices for reuse, recycle, and/or disposal of pans, especially the disposal of hazardous materials. Consider dumping the drip pan contents into a nearby larger-volume storage container and periodically recycling the contents of the storage container.

Frequent inspection of the drip pans is necessary due to the possibility of leaks in the pan itself. Check for random leaking of piping or valves and for irregular, slow drips that may increase in volume. Conduct inspections before forecasted rainfall events to remove accumulated materials. Empty accumulations immediately after each storm event.

Additional Resources

CASQA (California Stormwater Quality Association). 2004. *California Stormwater Best Management Practices Handbook: New Development and Redevelopment*. Menlo Park, CA. <https://www.casqa.org>.

EPA (US Environmental Protection Agency). 2014. *Spill Prevention and Control Plan*. Water: Best Management Practices. <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu>.

BMP 48: Hazardous Materials Management

Description

Good hazardous materials management prevents or reduces pollutant discharge to storm water from hazardous materials by reducing waste generation, properly using materials and disposing of waste, and training employees, contractors, subcontractors, and owners (Figure 118).

In a typical construction activity, hazardous materials and wastes can be discovered during construction (e.g., grading or digging), removed during demolition, or produced by construction activities (e.g., spent materials such as paints and degreasers). Hazardous materials on construction, industrial, commercial, or residential sites can include the following:

- Petroleum products
- Asphalt products
- Concrete curing compounds
- Roofing tar
- Acids
- Palliatives
- Septic waste
- Asbestos
- Stains
- Wood preservatives
- Pesticides
- Paints
- Solvents
- Gasoline
- Cleaners
- Waxes
- Any material listed in 40 CFR 110, 117, 261, or 203.

Applicability

Proper hazardous materials management should be used on all sites and properties with hazardous materials present.

Meeting the recommendations provided in this BMP is not a substitute for complying with local, state, and



Figure 118. Inspector checking hazardous material containers (WV DEP 2015).

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

☐	Sediment
☐	Phosphorus
☐	Metals
☐	Bacteria
☒	Hydrocarbons
☐	Litter

Other BMP Considerations

Relative Cost	\$\$
Maintenance Requirements	Medium
Ease of Implementation	Medium
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

federal regulations for storing, handling, transporting, and disposing of hazardous materials and wastes. Complying with applicable regulations protects human health and the environment from hazardous waste, reduces liability, and prevents unnecessary schedule interruptions (i.e., project or facility shut down due to environmental investigations/enforcement actions).

Applicable and related BMPs include BMP 15: Oil and Water Separators, BMP 46: Spill Prevention and Control, BMP 47: Construction Equipment Washing and Maintenance, BMP 49: Concrete Waste Management, BMP 50: Sanitary and Septic Waste Management, BMP 77: Outdoor Storage, BMP 83: Vehicle and Equipment Refueling, and BMP 84: Vehicle and Equipment Cleaning, Maintenance, and Repair.

Limitations

Hazardous waste that cannot be reused or recycled must be disposed of according to local, state, or federal regulation and by a licensed hazardous waste hauler. Depending on the type and quantity of waste, this requirement may be costly.

Design Basis

Hazardous materials management includes a wide variety of activities, such as reducing waste generation, properly using materials and disposing of waste, and training.

Reduce Hazardous Materials

The best method to prevent contamination from hazardous materials is to reduce the amount of hazardous materials present on a site. These BMPs can be applied to all sites to use less or eliminate hazardous materials when possible and to substitute materials with less toxic substances.

Industrial Sites

Starting a waste reduction program for industrial sites can be economically beneficial because it reduces raw material purchases and lowers waste disposal fees. Reducing the amount of industrial waste generated on site can be accomplished with the following source controls:

- Plan and sequence production.
- Assess process activities by collecting process-specific information, setting pollution prevention targets, and developing, screening, and selecting waste reduction options for further study.
- Modify processes or equipment to generate less waste.
- Implement a material tracking system and usage inventory to increase awareness about material use and reduce waste generation.
- Implement closed loop recycling.

Material Use

Use hazardous materials properly to prevent accidental spills and contamination of storm water runoff. The following guidelines apply to all sites:

- Follow manufacturers' directions in the use of all materials, including application rate and amounts.

- Maintain a clean and orderly work environment.
- Do not mix products together unless specifically recommended.
- Use the entire product before disposing of the container.
- Do not remove original product label from its container.
- Use ground cloths and drip pans under any work outdoors that involves hazardous materials such as oil-based paints, stains, rust removers, masonry cleaners, and others with warning labels. BMP 46: Spill Prevention and Control provides more information.
- If possible, move activities using hazardous materials indoors if adequate ventilation can be provided.
- Never apply pesticides when rain is expected.
- When using hazardous materials, place the container inside a tub or bucket to minimize spills.

Material Storage

Hazardous materials should always be properly stored and labeled. BMP 46: Spill Prevention and Control and BMP 77: Outdoor Storage provide additional information.

- Identify all chemical substances present.
- Label all containers with substance name, hazards, handling, first-aid information, and special instructions.
- Ensure an adequate number of containers with lids or covers is available.
- Protect hazardous waste storage areas:
 - Store the material indoors.
 - Cover outdoor storage areas with a roof.
 - Protect the material with a covering.
 - Keep containers off the ground.

Construction and Industrial Sites

- Identify, control, and enforce well-sited hazardous waste storage areas and disposal/stockpile areas. Locate hazardous waste storage areas away from storm drains and conveyances.
- Locate storage areas away from direct traffic routes.
- Store waste in sealed containers, constructed of suitable materials to prevent leakage and corrosion, and labeled according to applicable Resource Conservation and Recovery Act requirements and all other applicable federal, state, tribal, or local requirements.
- Store all outdoor containers in appropriately sized secondary containment (e.g., spill berms, decks, and spill containment pallets) to prevent spill discharge, or provide a similar, effective means to prevent pollutant discharge from these areas (e.g., storing chemicals in covered area or providing an on-site spill kit).
- Provide labels and signs for the storage area to educate contractors about proper storage and handling and to comply with regulatory requirements. Stack containers according to directions to avoid damage from improper weight distribution.
- Separate hazardous or toxic waste from construction and domestic waste.
- Provide the following engineer safeguards:
 - Overflow protection devices

- Secondary containment in case of leaks or spills.
- Protective guards around tanks and storage areas.
- An impervious barrier such as a liner, concrete pad, or berm.

Households

- Store hazardous materials out of the reach of children. Never transfer or store hazardous materials in food or beverage containers that could be misinterpreted by a child as food or a drink.
- Put *Mr. Yuck* stickers on hazardous household products and teach children to leave them alone. The stickers are available at Idaho CareLine 211 or (800) 926-2588.

Waste Disposal

Hazardous waste and their containers should be disposed of properly according to local, state, and federal regulations. Never dump products labeled as poisonous, corrosive, caustic, flammable, inflammable, volatile, explosive, or dangerous, or with warnings or cautions outdoors, in a storm drain, or down sinks, toilets, or drains. Section 3.10.7 “Construction Disposal Alternatives” provides a quick reference on disposal alternatives for specific construction wastes.

- Arrange for waste collection before containers overflow (additional containers and more frequent pickups will be needed during the demolition phase of a construction project).
- Ensure waste is disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility.
- Properly dispose of rainwater in secondary containment areas that may have mixed with hazardous waste.
- Recycle material such as used oil- or water-based paint when practical.
- Latex paints are not hazardous wastes but are not accepted in liquid form at the landfill. Leave latex paint uncovered in a protected place until it is dry and dispose of it with solid waste. Use kitty litter to quickly absorb the liquid, which allows the dry paint to be disposed of with solid waste.

Education and Training

Carelessness and poor judgment often result in problems associated with using and disposing of hazardous materials. Be fully aware of all the hazards at the site to decrease the potential for mishandling wastes that can contaminate storm water. Incorporating employee training (BMP 91) into waste management activities is strongly recommended. Best practices for construction and industrial sites include the following:

- Assign hazardous material inventory to a limited number of trained personnel. Have dedicated personnel keep an up-to-date inventory of all hazardous materials and wastes.
- Provide initial and annual training for employees on the hazards of and proper-handling procedures for hazardous wastes.
- Properly educate employees and subcontract personnel on the following:
 - Hazardous waste storage and disposal procedures.
 - Potential dangers to human health and the environment.
 - On-site safety procedures for hazardous materials.

- Ensure a dedicated construction supervisor oversees all handling of hazardous materials on site.

Maintenance

Regular maintenance of hazardous materials systems is important:

- Check containers with hazardous materials frequently for signs of leakage or damage.
- Replace leaking and/or deteriorating containers. Signs include the following:
 - External corrosion and structural failure
 - Installation problems
 - Evidence of spills or overfills
- Immediately clean up any liquid or dry material spills. Report spills to the proper authorities as required.
- Regularly collect and properly remove hazardous waste and materials from the site.

Additional Resources

CASQA (California Stormwater Quality Association). 2004. *California Stormwater Best Management Practices Handbook, New Development and Redevelopment*. Menlo Park, CA. <https://www.casqa.org>.

Idaho Careline (State of Idaho, Department of Health and Welfare Careline). 2018. 2-1-1 *CareLine: Poison Prevention*. <http://healthandwelfare.idaho.gov/Health/InjuryPrevention/Poison/tabid/1389/Default.aspx>

ITD (Idaho Transportation Department). 2014. *Best Management Practices*. Boise, ID: ITD.

BMP 51: Solid Waste Storage and Disposal

Description

Solid waste, more commonly known as garbage or trash, is any discarded material that is abandoned or recycled. Items that are commonly considered solid waste include product packaging, landscape clippings, paper, bottles, food scraps, construction wastes, paint, and batteries. Solid waste management procedures and practices are designed to prevent or reduce the discharge of litter and other pollutants to storm water (Figure 121). Practices include tracking and reducing waste generation, using proper storage and disposal methods, reusing and recycling when possible, and preventing run-on and runoff from waste management areas.

More information on proper handling, storing, and disposing hazardous waste is provided in BMP 48: Hazardous Materials Management. Storing and handling pesticides and other landscaping chemicals is provided in BMP 78: Fertilizer Management and BMP 79: Pesticide Management. BMP 46: Spill Prevention and Control provides information on properly storing and handling liquid waste.

Applicability

This BMP applies to industrial operations, construction sites, businesses, residences, public parks, recreation areas, and large outdoor events where solid waste is generated and temporarily stored.

Limitations

For commercial and municipal operations, an effective waste management system requires training employees (BMP 91) and signage. Extra management time may be required to ensure that all personnel follow proper procedures for storing, disposing, and handling solid waste.

Limitations are related to disposing of residential solid waste (<https://www.deq.idaho.gov/waste-management-and-remediation/solid-waste/residential-household-wastes/>) and restrictions on burning household residential waste in burn barrels



Figure 121. Pet waste container.

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- | |
|---|
| ☐ Sediment |
| ☐ Phosphorus |
| ☐ Metals |
| ☒ Bacteria |
| ☐ Hydrocarbons |
| ☒ Litter |

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Easy
Ease of Installation	Easy
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

or other types of incinerators (<https://www.deq.idaho.gov/air-quality/smoke-and-burning/can-i-burn/>).

Design Basis

The best way to reduce the impact of waste on storm water runoff is to reduce the amount of waste generated. Practices that reduce the amount of solid waste disposed of in a landfill are encouraged, including waste tracking, waste reduction, recycling, and composting. Properly storing and disposing of solid waste that is generated is required to protect environmental and aquatic resources.

Waste Tracking

Tracking the amount of waste materials used on site or in the home increases awareness of the amount of materials used and provides a baseline for waste reduction. Consider the following when tracking waste:

- Prioritize waste streams using manifests, biennial reports, permits, environmental audits, Superfund Amendments and Reauthorization Act Title III reports, emission reports, and NPDES monitoring reports.
- Prepare inventory reports.
- Maintain data on chemical spills.
- Track emissions.
- Review raw material and production data—composition sheets, material safety data sheets, batch sheets, product or raw material inventory records, production schedules, and operator data logs.
- Review economic data:
 - Waste treatment and disposal costs
 - Product utility and economic costs
 - Operation and maintenance labor costs.

Waste Reduction

Waste reduction can be accomplished by selecting products with the least amount of packaging or materials that can be returned and reused, purchasing durable goods rather than disposable ones, and buying in bulk. For industrial or commercial operations, assess process activities where wastes are generated to determine where waste can be eliminated or reduced. This involves collecting process-specific information, setting pollution prevention targets, and developing, screening, and selecting waste reduction options for further study. Modify processes or equipment to generate less waste.

Recycling

Recycling recovers materials from the solid waste stream to make new products, which reduces the amount of virgin raw materials needed to make products and the amount of material going into landfills. Regions vary on the items collected for recycling. Common items that may be recycled include glass, cardboard, some types of plastics, aluminum cans, steel cans, scrap metal, wire,

paper, and gray board. Other nontraditional recyclables include used motor oil, batteries, printer cartridges, and electronics (E-waste).

Some jurisdictions offer curbside recycling to residential and commercial customers. Recycling or material separation may also be required for construction sites.

Composting

Approximately 38% of municipal solid waste consists of organic materials, such as food waste, yard wastes, wood waste, and manure. Composting is the process of creating the optimal conditions for biological decomposition of organic material to produce a stable, nutrient-rich material that can be used as a soil amendment or fertilizer for plants.

Composting can be accomplished on a small scale, such in a residential back yard, or large scale, such as a municipal operation. For either operation, controlled decomposition requires a proper balance of *green* organic materials (e.g., grass clippings, food scraps, manure), which contain large amounts of nitrogen, and *brown* organic materials (e.g., dry leaves, wood chips, branches), which contain large amounts of carbon but little nitrogen.

Storage

For both construction and domestic waste, provide waste containers (e.g., dumpster or trash receptacle) of sufficient size and number to contain all waste expected to be generated. On construction sites, clean up and dispose of waste in designated waste containers on each work day. Waste containers must be cleaned up immediately if they overflow. The following practices are recommended:

- All waste containers kept outside should have lids.
- Storage areas for building products should provide either cover (e.g., plastic sheeting or temporary roofs) to prevent these products from coming into contact with rainwater or use a similarly effective means designed to prevent pollutant discharge from the storage areas.
- Replace leaking waste containers.
- Inspect the storage area regularly to pick up loose scraps of material and dispose of them properly.
- Ensure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, and curing compounds) are not disposed of in dumpsters designated for construction debris.
- In areas close to bear habitat, ensure storage containers have bear-proof locks and lids.
- Collect and properly dispose of pet waste at private residences and in public areas.

Run-on and Runoff Prevention

Preventing storm water from entering or running off the waste storage area reduces or eliminates the potential for contaminants from entering the runoff and polluting downstream water bodies. The following best practices prevent run-on and runoff:

- Protect waste materials from direct contact with rain by covering the area with a permanent roof or covering waste piles with temporary covering material, such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or hypalon.

- If possible, place waste storage areas indoors after ensuring that all safety concerns such as fire hazards and ventilation are addressed.
- Store waste materials on a paved surface that is bermed or drains to a dead-end holding tank.
- To avoid tracking materials off site, keep the waste management area clean by sweeping and cleaning up spills immediately. Never drive vehicles through spills. If necessary, wash vehicles in designated areas before the vehicles leave the site (BMP 84). Collect and properly dispose of the washwater.
- Cover, enclose, or berm industrial wastewater management areas whenever possible to prevent contact with run-on or runoff.

Disposal

Municipal solid waste should be collected and properly disposed of in a solid waste disposal facility. Hazardous waste must be disposed of in an appropriate disposal and/or recycling facility.

Education

Educate employees, subcontractors, and suppliers on solid and sanitary waste disposal procedures and potential dangers to the environment and human health.

Instruct employees, subcontractors, and suppliers in identifying solid and sanitary wastes, hold regular meetings to update staff on the current standing of wastes on site, and implement a solid waste disposal plan.

Maintenance

Inspect solid waste collection containers regularly and arrange for regular waste collection.

Additional Resources

CASQA (California Stormwater Quality Association). 2004. *California Stormwater Best Management Practices Handbook: New Development and Redevelopment*. Menlo Park, CA. <https://www.casqa.org>

EPA (US Environmental Protection Agency). 2014. *General Construction Site Waste Management*. Water: Best Management Practices.

ITD (Idaho Transportation Department). 2014. *Best Management Practices*. Boise, ID: ITD.

BMP 75: Street Sweeping

Description

Streets, roads, and highways accumulate potential storm water pollutants such as sediment, debris, trash, road salt, and trace metals. Street sweeping, if conducted properly, can reduce the pollutant load to receiving waters, reduce potential clogging of storm sewer systems and downstream BMPs, and control dust (Figure 188).

Applicability

Street sweeping can be used in most urban areas where sediment and litter accumulation is a concern. In cold climates, street sweeping used during ice-free periods and after the spring snowmelt removes the salt, sand, and grit applied to the roads throughout the winter. Permeable pavements (BMP 19) should be vacuumed with appropriate equipment as part of basic routine maintenance to ensure the pavement operates effectively.

Streets adjacent to an active construction site should be swept when necessary as part of the construction site storm water management plan. Construction sites should also take measures to control sediment track out (BMP 40: Vehicle Sediment Control) to limit the need for street sweeping.

Limitations

Street sweeping is not effective at removing oil and grease. Older mechanical sweepers are limited in ability to remove fine sediment, and sweepers with newer technology can be costly.

Design Basis

Three types of street-sweeping technologies are available: traditional mechanical sweepers that use a broom and conveyor belt, vacuum-assisted sweepers, and regenerative air sweepers that blast air onto the pavement to loosen sediment particles and vacuum



Figure 188. Regenerative air system sweeper for the City of Hayden, Idaho.

Primary BMP Functions and Controls

☐ Construction	☒ Permanent
☐ Erosion Control	☒ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- Sediment
- Phosphorus
- Metals
- Bacteria
- Hydrocarbons
- Litter

Other BMP Considerations

Relative Cost	\$\$\$
Maintenance Requirements	Medium
Ease of Installation	N/A
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

them into a hopper. For maximum particulate removal, sweepers should be operated at optimum manufacturer-recommended speeds and sweeping patterns, with brushes properly adjusted.

The various sweeping technologies are appropriate in different situations. In general, mechanical broom sweepers remove larger and heavier debris than other technologies and are better for removing construction debris and granular materials such as millings and gravel. Vacuum-assisted sweepers clean rough and potholed roadways and with extended nozzles can efficiently clean street gutters. A benefit of regenerative air sweepers is they do not vent or exhaust back into the atmosphere, but the debris must be small enough to be picked up. Some regenerative air sweepers also use water to control ambient dust and lubricate the impeller.

Schedule

A regular sweeping schedule is recommended with a minimum monthly sweeping of curbed streets during the nonwinter months when the streets are clear of snow. More frequent street sweeping may be needed depending on site conditions and in the vicinity of active construction sites. Complete street sweeping during dry weather. Wet cleaning or flushing of streets should be avoided; use dry methods where possible.

Street-sweeping schedules should be posted with signs along streets and on the municipality's website so that the public knows to not park cars along the street during designated sweeping days.

Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, and proximity to watercourses:

- Increase sweeping frequency for streets with high pollutant loads, especially in high traffic and industrial areas.
- Conduct street sweepings before the wet season to remove accumulated sediments.
- Increase the sweeping frequency for streets in special problems areas, such as streets around special events, areas of high litter, or high erosion zones.

To evaluate the effectiveness of a street-sweeping program, municipalities should maintain accurate logs of the number of curb-miles swept and the amount of waste collected.

Sweepings Storage and Disposal

Street sweeping material includes sediment, salt, trace metals, leaves, trash, and other debris. The collected sweepings contain pollutants that should be tested before disposal to determine if the material is hazardous. Municipalities must adhere to all federal and state regulations that apply to the sweeping's disposal and reuse.

The debris and dirt from street sweeping activities should be stored and disposed of properly. Swept material should not be stored along the side of the street or near a storm drain inlet. Keep debris storage to a minimum during the wet season or ensure debris piles are contained or covered.

Maintenance

Street-sweeping equipment should be regularly maintained and kept in good working order. Regularly inspect vehicles and equipment for leaks and repair promptly. Keep spare parts in stock to prevent downtime. Maintenance requirements may be greater for certain types of sweepers. Replace old sweepers with new technologically advanced sweepers, such as regenerative air sweepers, that maximize pollutant removal.

Additional Resources

CASQA (California Stormwater Quality Association). 2004. *Stormwater Best Management Practice Handbook: Municipal*. Menlo Park, CA. <http://www.casqa.org/>

EPA (US Environmental Protection Agency). 2017. *Parking Lot and Street Cleaning*.

BMP 76: Storm Water System Cleaning

Description

A storm water system is a network of gutters, catch basins, inlets, pipes, and detention facilities that collect and convey storm water runoff to a receiving water body. Proper BMP implementation should prevent pollutants from entering the storm water system, but some common pollutants will be found in storm systems including trash and debris, sediments, oil and grease, antifreeze, paints, cleaners and solvents, pesticides, fertilizers, animal waste, and detergents (Figure 189).

Routine cleaning of the storm water system reduces the amount of pollutants that reach receiving waters, prevents clogging of drains and inlets, and ensures the system can function hydraulically to avoid flooding.



Figure 189. Cleaning a sediment trap.

Applicability

Storm water system cleaning should be done periodically on all storm water systems by the municipality or other responsible party, such as homeowner associations, businesses, landowners, or industries for systems located on private land.

Given special attention to portions of the storm water system with relatively flat grades or low flows because they rarely achieve high enough flows to flush out pollutants.

Limitations

The time and cost for storm water system cleaning can be significant. Communities may target recurrent problem areas or prioritize to determine what areas will be maintained and when they will be maintained.

Design Basis

A variety of jet/vacuum vehicles can be used to remove debris from storm water inlets and pipes. This equipment breaks up clogged/accumulated material with high-pressure water jets and vacuums

Primary BMP Functions and Controls

☐ Construction	☒ Permanent
☐ Erosion Control	☒ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- Sediment
- Phosphorus
- ◐ Metals
- Bacteria
- ◐ Hydrocarbons
- Litter

Other BMP Considerations

Relative Cost	\$\$
Maintenance Requirements	Medium
Ease of Installation	NA
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	5 acres
Max. Upstream Slope	25%
NRCS Soil Group	ABCD
Min. Ground Water Separation	3 feet
Min. Bedrock Separation	6 feet

the material from the system. A variety of methods for cleaning inlets are available, including manual cleaning, vacuum cleaning, and vacuum combination jet cleaning.

Schedule

Storm water systems should be regularly inspected, with more frequent inspections during the wet season to check for problem areas where sediment or trash accumulates more often.

Storm water systems should be cleaned so blockage of storm pipe outlets is prevented. The sump in catch basins and inlets should not exceed 40%–50% of its storage capacity. There should never be less than 6 inches of clearance from the debris surface to the invert of the lowest pipe. Catch basins with very little storage volume may need more frequent inspections and cleaning.

Semiannual cleaning of systems in residential streets and monthly cleaning of systems in industrial streets are recommended. Schedule more frequent cleaning in the fall as leaves can contribute 25% of the nutrient load in inlets. Inspection and cleaning before the wet season is recommended.

Staff Training

Operators must be properly trained in inlet maintenance including waste collection and disposal methods. Staff should also be trained to report water quality problems and unauthorized nonstorm water discharges to the proper authorities. Evidence of illegal discharges or illicit connections to the storm water system include paint spills, oil sheen, and discoloring and odors.

Tracking

Accurate records of the number of catch basins cleaned and the amount of waste collected should be kept and may be required by MS4 or other permits held by the municipality. Track the location and maintenance of storm drains using a database and spatial referencing system (e.g., Global Positioning System or geographic information system). Knowing the type and era of the storm drain system can be useful because some inlets/catch basins are self-cleaning while others have some trapping capacity.

Use a recording system for tracking illegal dumping incidents and include the location, quantities, date and time, mode of dumping, and responsible parties (BMP 46: Spill Prevention and Control). Stenciling storm drains with messages such as “Dump No Waste – Drains to Stream” can prevent illegal disposal of pollutants.

Material Disposal

Most waste from storm system cleaning is of acceptable quality for landfills. If it is suspected that waste contains hazardous materials, it should be tested and disposed of accordingly. Water used in storm system cleaning should be collected and properly disposed of at a sanitary wastewater treatment facility.

Additional Resources

CWP (Center for Watershed Protection). 2009. *Urban Stormwater Restoration Manual Series 8: Municipal Practices and Programs*. Ellicott, MD.

EPA (US Environmental Protection Agency). 2017. *Storm Drain System Cleaning*.
<https://www.epa.gov/npdes/npdes-stormwater-program>

BMP 77: Outdoor Storage

Description

Storm water can become polluted when contaminants in materials or liquids stored on-site wash off or dissolve into storm water runoff. If raw materials or liquids must be stored outdoors due to indoor space limitations, proper storage techniques can prevent or reduce the discharge of pollutants to storm water.

Contaminant prevention is achieved by reducing contact with storm water, installing safeguards against accidental releases, using secondary containment, conducting regular inspections, and training employees in safe handling and operating procedures and spill cleanup techniques.

Applicability

Proper outdoor storage should be used at all construction sites, industrial sites, commercial facilities, and municipal facilities when storing sensitive materials (Figure 190):

- Soil stabilizers and binders
- Fertilizers, pesticides, and herbicides
- Detergents and other cleaning compounds
- Building material and site waste
- Waste oils and petroleum-based products
- Solvents and liquids
- Construction equipment
- Asphalt and concrete compounds
- Hazardous wastes and materials
- Any substance detrimental to environmental conditions

Limitations

Tarps and temporary protective structures can be susceptible to wind damage. Permanent storage sheds should meet building and fire code requirements and may need a building permit before construction.

Accidental releases of materials from aboveground liquid storage tanks, drums, and dumpsters present



Figure 190. Outdoor storage of hazardous materials (*SafeSpace*).

Primary BMP Functions and Controls

☒ Construction	☐ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

☐	Sediment
☐	Phosphorus
☒	Metals
☐	Bacteria
☒	Hydrocarbons
☐	Litter

Other BMP Considerations

Relative Cost	\$\$\$
Maintenance Requirements	Medium
Ease of Installation	Hard
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

the potential for contaminating storm and ground waters with many pollutants. Properly training employees in spill cleanup procedures prevents contamination. This requires additional time and resources to educate employees.

Design Basis

Depending on location, materials, and storage capacity, some facilities may be covered by the SPCC rule and will be required to prepare and implement a SPCC plan. EPA provides more information at <http://www2.epa.gov/oil-spills-prevention-and-preparedness-regulations/overview-spill-prevention-control-and>. Use the following design approaches to protect materials from rainfall, run-on, runoff, and wind dispersal:

Storage Areas

- All sensitive materials should be covered at all times. Cover the storage area with a roof when possible.
- If material cannot be covered with a roof, protect the material with a temporary covering made of polyethylene, polypropylene, or hypalon, and secure it with weighted tires or sandbags.
- Locate outdoor storage areas on nonpermeable paved surfaces free of cracks and gaps, where possible.
- When sensitive materials cannot be located in a storage container or on a nonpermeable paved surface, line the soil or gravel with an impermeable barrier.
- A minimum slope of 1.5 % is recommended for outdoor storage areas to minimize water pooling on site. Minimizing water pooling is particularly important with materials that may leach pollutants into storm or ground water, such as compost, logs, and wood chips.
- Build a berm around storage areas to minimize storm water run-on and contain unexpected spills.
- Design the storm water system to minimize catch basins in the interior of the area as catch basins in the interior tend to fill rapidly with manufacturing material.
- Always have MSDS available for all materials detrimental to soil and/or water quality. The MSDS should include information on procedures for handling substances in a safe manner and information on physical characteristics, toxicity, reactivity, storage, disposal, and spill-handling procedures.

Container Management

To limit the possibility of storm water pollution, containers used to store dangerous waste or other liquids should be kept inside a building unless this is impractical due to site constraints. If the containers are placed outside, employ the following procedures:

- Place dumpsters used to store items awaiting transfer to a landfill in a lean-to structure or keep otherwise covered. Keep dumpsters in good condition.
- Tell employees to avoid dumping liquids in dumpsters and ensure dumpster lids are always closed.
- Place a fillet (radius) on both sides of the curb to facilitate moving the dumpster.
- Keep waste container drums in an area such as a service bay and ensure the drums have tight-fitting lids affixed at all times. If drums are kept outside, store them in a lean-to type

structure, shed or walled-in container to keep rainfall from reaching the drums. The storage area should have berms and be paved with an appropriate material.

- Label containers or tanks clearly.

Storage of Liquids

With the design approaches listed above, use the following measures to protect liquid in storage containers:

- Store hazardous materials to meet specific federal, state, and local standards. Some sensitive areas, such as source water protection zones, may require special containment.
- Use a *doghouse* shed for storing small liquid containers if the environment is appropriate. A doghouse shed consists of two solid structural walls and two canvas-covered walls. The floor is wire mesh and above secondary containment.
- Place tight-fitting lids on all containers. Secure drums stored in areas where unauthorized persons may gain access to prevent accidental spillage or unauthorized use.
- Liquid storage containers should be resistant to corrosion or damage from the materials stored for the duration of use on site.
- Berm or surround the tank or container with an appropriate secondary containment system with an impervious surface (see below).
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during filling and unloading.
- Place containers used for removing liquid in a containment area. Use a drip pan at all times.
- Install overflow protection devices to warn the operator or provide automatic shutdown of transfer pumps.
- Install protection guards (bollards) around tanks and piping to prevent construction vehicle damage.
- Label containers or tanks clearly.
- Install an oil and water separator, if necessary, in facilities with *spill ponds*. Facilities using spill ponds designed to intercept, treat, and/or divert spills should contact the appropriate regulatory agency regarding environmental compliance.
- Facilities storing reactive, ignitable, or flammable liquids should comply with fire codes. A SPCC plan may be required when storing contaminated or hazardous liquids on site.

Secondary Containment

Liquid storage tanks should be surrounded by a secondary containment system with an impervious surface. Leaks can be detected more easily and spills can be contained when secondary containment systems, such as berms, dikes, liners, vaults, or double-walled tanks, are installed. In an emergency, dikes can be used for controlling large spills or releases from liquid storage transfer areas.

Containment dikes are berms or retaining walls designed to hold spills. The dike surrounds the area and holds the spill, keeping spill materials separated from storm water. Containment dikes should be large enough to contain 100% of the volume of the largest container plus the amount of rainwater equal to a 25-year storm event. Diked areas used as secondary containment for vehicles containing liquid waste should be capable of holding an amount equal to the volume of the tank

truck compartment. The containment area design must include a means to remove uncontaminated storm water to maintain capacity and effectiveness.

Dike construction material should be impervious and strong enough to safely hold spilled materials. Dike materials consist of earth, concrete, synthetic materials, metal, or other impervious materials. Avoid using metal containers, concrete, and some plastics for dike materials if strong acids or bases will be stored outside. These dike materials could react with strong acids or bases if a spill occurs. More active organic chemicals may require special liners for dikes.

Curbing is common at many facilities in small areas where handling and transfer of liquid materials occur. Curbing is usually small scale and does not contain large spills like diking. Curbing can redirect contaminated storm water away from the storage area and can be used in areas where liquid materials are transferred from one container to another. Asphalt is a common material used for curbing; however, earth, concrete, synthetic materials, metal, or other impenetrable materials may also be used. Curbs should have manually controlled pump systems rather than common drainage systems to collect spilled materials. The curbed area should be inspected regularly to clear clogged debris and maintained frequently to prevent overflow of any spilled materials. Slope the liquid storage area, located inside the curb, to a drain. Install a dead-end holding tank in the drain for used oil or dangerous waste.

Construction Guidelines

All employees should receive training for properly handling outdoor material, liquid storage containers, and spill cleanup procedures. Employees should be familiar with the SPCC plan and have the tools and knowledge to immediately begin cleanup when a spill occurs. When dangerous waste, liquid chemicals, or other wastes are loaded or unloaded at the construction site, ensure properly trained employees are present.

Use engineering safeguards to reduce accidental releases of pollutants and prevent operator errors:

- Overflow protection devices on tank systems warn the operator to shut down transfer pumps when the tank reaches full capacity.
- Protective guards (bollards) around tanks and piping prevent vehicle or forklift damage.
- Clearly tag or label all containers, tanks, and valves.

Maintenance

Good maintenance practices are prevent storm water contamination from materials and liquids stored on site:

- Keep outdoor storage containers in good condition, check regularly for leaks, and ensure storage container lids are on tightly.
- Sweep paved storage areas monthly. Do not hose down areas contributing to storm drains.
- Store and maintain appropriate spill cleanup materials, such as brooms, dustpans, and vacuum sweepers, near the storage area.
- Schedule frequent waste collection to prevent overfilling storage containers.

Conduct the following inspections weekly or before storm events:

- Inspect for damage or cracks and repair or patch curbing as necessary.

- Check for accumulated rainfall in the secondary containment system (remove and discharge properly).
- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanges, coupling, hoses, and valves).
- Check for leaks or spills when pumping liquids or gases from a truck or rail car to a storage facility or vice versa.
- Inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, tank walls, and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system. Correct problems or potential problems immediately.
- Inspect tanks, containers, and containment-holding tanks daily for leaks and spills. Replace leaking and/or deteriorating containers and collect all spilled liquids for proper disposal.
- Inspect tank systems and regularly test the tank's integrity to identify problem areas. Registered and specifically trained professional engineers can identify and correct potential problems such as loose fittings, poor welding, and improperly or poorly fitted gaskets on newly installed tank systems.
- During and after significant storms or spills, inspect dikes for washout or overflows.

Additional Resources

- CASQA (California Stormwater Quality Association). 2015. *California Stormwater Best Management Practices Handbook: Construction*. Menlo Park, CA. <http://www.casqa.org/>
- EPA (US Environmental Protection Agency). 2017. *General Construction Waste Management, Hazardous Waste Storage*. <https://www.epa.gov/hw/learn-basics-hazardous-waste>
- Washington State Department of Ecology. 2012. *Stormwater Management Manual for Western Washington*. Lacey, WA. Publ. 12-10-030. <http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

BMP 78: Fertilizer Management

Description

Proper fertilizer application, storage, handling, and disposal prevent contamination of surface water and ground water and adverse impacts to aquatic life. Proper management also prevents increased algae growth in water bodies. Nitrogen and phosphorous are the fertilizer components of greatest concern to water quality (Figure 191).

Applicability

Good fertilizer management applies to all locations in agricultural production or landscaping, including those maintained by municipalities, individual homeowners, businesses, commercial operations, or homeowner associations.

Limitations

Few limitations are associated with implementing proper fertilizer management practices. Some larger sites in agricultural production or areas with extensive landscaping may require employees trained specifically for managing these facilities. Other options include hiring agricultural or horticultural professionals to manage and maintain these facilities who know the proper use of fertilizers.

Fertilizer applied through an irrigation system (chemigation) has regulatory requirements including equipment inspection before use. For more information, visit the Idaho State Department of Agriculture (ISDA 2006) at <https://agri.idaho.gov/main/chemigation/>. These requirements are designed to protect the source of irrigation water, whether it is ground water, surface water, or a municipal water supply from contamination.

Design Basis

Within landscape areas, one of the best practices to reduce or eliminate the need for fertilizers is to use native and adapted vegetative species. These types of plants do not require additional fertilization because



Figure 191. Landscape fertilizing.

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- ☐ Sediment
- ☒ Nitrogen
- ☒ Phosphorus
- ☐ Metals
- ☐ Bacteria
- ☐ Hydrocarbons
- ☐ Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Low
Ease of Installation	N/A
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

they grow well in native soil without added fertilizers. Additionally, native and adapted plants require less water and irrigation, which reduces the potential for irrigation runoff water to transport chemicals off site.

For landscaping areas, agricultural fields, or residential gardens that do require replacing soil nutrients through fertilization, select the appropriate fertilizer type and apply it at the appropriate rate and time using the right method. Fertilizers should be selected based on the site's unique soil, plant, and climatic conditions to minimize the amount of nitrogen or phosphorous that is not used by plants and lost either through leaching or runoff.

Fertilizer Selection

Using the appropriate form of nitrogen fertilizer can reduce leaching to ground water sources. For example, nitrate forms of nitrogen fertilizer are readily available to plants but are subject to leaching losses. Nitrate forms should be used when plants are vigorously growing and can use the amount applied. Ammonium nitrogen fertilizers are not mobile because the ammonium form of nitrogen binds to soil particles and the plant roots have to reach the soil particle where the ammonium nitrogen is located. In warm and moist soil conditions, bacteria convert the ammonium nitrogen into the nitrate form, which takes a few days to a few weeks depending on the conditions. In addition, some types of ammonium nitrogen are subject to volatilization and significant losses may occur if not incorporated into the soil after application. Sources of organic nitrogen, such as compost or aged manure, are converted over time by soil microbes into forms available to plants, and are another fertilizer option to use.

Phosphorous fertilizers are less subject to leaching because most forms of phosphorus bind to the soil particles and do not move through the soil column. Surface water runoff that carries soil particles containing phosphorus into rivers or streams are a concern. To minimize phosphorous in surface runoff, use it only when needed as determined through soil testing and at the recommended rates.

Application Rate

Soils should be tested and evaluated for nutrient deficiencies every year to determine the amount of fertilizer needed for a particular location. In addition to soil characteristics, account for other sources that will contribute nitrogen and phosphorous to the soil. Sources of nitrogen include plants in the legume family, irrigation water, and organic matter. A portion of the soil organic matter is converted over time by soil microbes into forms of phosphorous and nitrogen that are available for the plant to use. It may take several years for the phosphorus and nitrogen contained in organic material to become *plant available*. For more information on fertilizer application see the [*University of Idaho Extension*](#) (2011).

Application Timing

The timing of fertilizer application is important. Fertilizers should ideally be applied during the time of year that is optimal for maximum vegetation uptake and growth. Generally, in the spring is best with small additional applications in certain areas throughout the growing season. When application practices allow the nitrate form to remain in the soil after the growing season, the nitrate can potentially leach into the ground water. Fertilizers should not be applied during high temperatures, windy conditions, or immediately before or during rainfall events.

Application Techniques

Use application techniques that increase efficiency and allow the lowest effective application rate. Fertilizer placement in the root zone enhances plant nutrient uptake and minimizes losses. Subsurface-applied or incorporated fertilizer should be used instead of surface application of fertilizer. Mechanically incorporate surface-applied fertilizers after application. Never apply fertilizers to frozen ground or near surface waters or storm water conveyance channels and limit use on slopes and areas with high runoff or overland flow.

Fertilizers should be applied according to the label instructions. Overapplying fertilizers can pollute surface water and ground water resources. Mix and load sprayers in an area with spill control in place.

Storage and Handling

Follow label directions for storing and mixing fertilizer and disposing of empty containers. Protect permanent fertilizer storage and mixing sites from spills, leaks, or storm water infiltration and locate them away from wellheads and surface water bodies.

Fertilizers should be stored in enclosed areas, in covered impervious containment (plastic sheeting or temporary roofs), or use a similarly effective means to prevent these chemicals from coming into contact with rainwater (BMP 77: Outdoor Storage and BMP 46: Spill Prevention and Control). MSDS should be readily accessible at all times.

Maintenance

Keep fertilizer application equipment properly calibrated according to the manufacturer's instructions and in good repair. For larger agriculture operations, recalibrate equipment periodically to compensate for wear in pumps, nozzles, and metering systems. Calibrate sprayers when new nozzles are installed.

Keep and review records to evaluate the effectiveness of pesticides used. Comply with all disposal requirements included on the registered fertilizer label.

Additional Resources

Colorado UDFCD (Colorado Urban Drainage and Flood Control District). 2010. *Urban Storm Drainage Criteria Manual, Volume 3 Best Management Practices*. Denver, CO.
<http://udfcd.org/wp-content/uploads/2014/07/Title-Page.pdf>

EPA (US Environmental Protection Agency). 2001. *Source Water Protection Practices Bulletin: Managing Agricultural Fertilizer Application to Prevent Contamination of Drinking Water*.
<http://nepis.epa.gov/Exe/ZyNET.exe/>

EPA (US Environmental Protection Agency). 2017. *Municipal Landscaping*.
<https://archive.epa.gov/greenacres/web/html/index.html>

University of Idaho Extension. 2014. *Idaho Master Gardener Program Handbook*. 16th ed. Moscow, ID. <http://www.extension.uidaho.edu/mg/resources/handbook/MGHbook.pdf>

BMP 79: Pesticide Management

Description

Pesticides are used to control organisms considered to be pests and include herbicides, insecticides, fungicides, rodenticides, and others. Pesticides must be properly applied, stored, handled, and disposed of to prevent contamination of surface water and ground water (Figure 192).



Figure 192. Pesticide application.

Applicability

Good pesticide and herbicide management applies in all locations with landscaping, including those maintained by municipalities, individual homeowners, businesses, commercial operations, or homeowner associations.

Limitations

Some pesticides are categorized as *restricted use* pesticides because they are excessively hazardous to the environment or the applicator. These pesticides may only be used by a certified applicators licensed by the State of Idaho. EPA (2015) provides a list of restricted pesticides <http://www2.epa.gov/pesticide-worker-safety/restricted-use-products-rup-report>.

All pesticides are regulated by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and any use of a pesticide in a “manner inconsistent with label instructions is a violation of this Act.”

Design Basis

One of the best practices to reduce or eliminate the need for pesticides and herbicides is to use native and adapted vegetative species within landscape areas. Native and adapted plants require less water and irrigation, which reduces the potential for irrigation runoff water to transport chemicals off site. Many native plants are also naturally resistant to pests.

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- ☐ Sediment
- ☒ Nitrogen
- ☒ Phosphorus
- ☐ Metals
- ☐ Bacteria
- ☐ Hydrocarbons
- ☐ Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Low
Ease of Installation	N/A
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Pesticides and herbicides should be selected according to the characteristics of the site and the particular pest or weed. Half-life, solubility, and adsorption should be compared to site characteristics to determine the safest chemical. Pesticides should readily degrade in the environment and/or have properties that strongly bind it to the soil.

Application Guidelines

All pesticides, herbicides, and other chemicals should be applied according to the product label instructions. Avoid overapplying chemicals that can pollute surface water and ground water resources.

Pesticides and herbicides should not be applied during high temperatures, windy conditions, or immediately before or during rainfall events. Freshly treated wet applications should dry thoroughly before human or animal traffic enter the area. Mix and load sprayers in an area where spill control is in place.

Records and signage of pesticide application, emergency information, and pesticide safety may be required by EPA's Pesticide Worker Protection Standard: <https://www.epa.gov/pesticide-worker-safety/pesticide-worker-protection-standard-how-comply-manual>.

Owners of agricultural establishments and members of their immediate families are exempt from many worker protection requirements.

Local regulations may limit the application of pesticides around wells and surface water. Generally, pesticides should not be sprayed in proximity of open waters, including wetlands, ponds, stream, sloughs, or ditches, unless they are approved for use near wetlands and ponds to control aquatic weeds or mosquitos. Section 3.5.6 provides more information on mosquito control for storm water BMPs.

Integrated Pest Management

Integrated pest management (IPM) focuses on long-term prevention of pests or their damage by managing the ecosystem using targeted biological, chemical, cultural, and physical measures that remove pests with minimal or no use of chemical pesticides. IPM programs generally include five major components as follows:

1. Pest identification
2. Monitoring and assessing pest numbers and damage
3. Guidelines for when management action is needed—consider pest occurrence and history when developing pest management strategies
4. Preventing pest problems
5. Using a combination of biological, cultural, physical/mechanical and chemical management tools

IPM Management Tools

Biological control is the use of natural enemies—predators, parasites, pathogens, and competitors—to control pests and their damage. Invertebrates, plant pathogens, nematodes, weeds,

and vertebrates have many natural enemies. For example, introduce natural enemies of pests such as lady beetles (or lady bugs) and green lacewings. Pesticide use may kill these natural enemies.

Cultural controls reduce pest establishment, reproduction, dispersal, and survival. Changing irrigation practices can reduce pest problems—too much water can increase root disease and weeds. Proper plant selection, planting time, and planting method can reduce susceptibility to insects, pests, and diseases.

Mechanical and physical controls kill a pest directly or make the environment unsuitable for it. Traps for rodents are examples of mechanical control. Physical controls include mulches for weed management, solar heating, handpicking, mowing, hoeing, steam sterilization of the soil for disease management, or barriers such as screens to keep birds and insects out or *collars* around seedlings. The use of soil amendments, such as compost, is known to control some common diseases in plants and installing an amended soil and landscape system can preserve both plant and soil systems. Rotate annual garden plants to reduce the buildup of soil-borne pests. Clean up plant litter and remove weeds before they go to seed. Remove infested plant residue from the garden so pests do not overwinter.

Chemical control uses pesticides. In IPM, pesticides are used only when needed and in combination with other approaches for more effective, long-term control. Pesticides are selected and applied to minimize possible harm to people and the environment. Consider applying environmentally friendly chemical alternatives such as insecticidal soaps, horticultural oils, and other such measures when practical and effective and when mechanical approaches are impractical.

With IPM, use the most selective pesticide to do the job and the safest for other organisms and air, soil, and water quality; use pesticides in bait stations rather than sprays; or spot-spray a few weeds instead of an entire area. Spot treat pests rather than treating the entire area, and time pesticide application to minimize host plant damage and maximize pest control.

Storage and Handling

Do not store large quantities of pesticides for long periods of time. Adopt the *first in, first out* principle and use the oldest products first.

Pesticides should be stored in enclosed areas, in covered impervious containment (plastic sheeting or temporary roofs), or in a similar manner to prevent the chemicals from coming into contact with rainwater (BMP 77: Outdoor Storage and BMP 46: Spill Prevention and Control). MSDS should be readily accessible at all times.

Maintenance

Keep pesticide equipment properly calibrated according to manufacturer's instructions and in good repair. Recalibrate equipment periodically to compensate for wear in pumps, nozzles, and metering systems. Calibrate sprayers when new nozzles are installed. Keep and review records to evaluate the effectiveness of pesticides used. Comply with all disposal requirements included on the registered pesticide, herbicide, or insecticide label.

Additional Resources

Colorado UDFCD (Colorado Urban Drainage and Flood Control District). 2010. *Urban Storm Drainage Criteria Manual, Volume 3 Best Management Practices*. Denver, CO.

<http://udfcd.org/wp-content/uploads/2014/07/Title-Page.pdf>

EPA (US Environmental Protection Agency). 2016. *Municipal Landscaping*.

<https://archive.epa.gov/greenacres/web/html/index.html>

University of Idaho Extension. 2016. *Idaho Master Gardener Program Handbook*. 18th ed.

Moscow, ID. <http://www.extension.uidaho.edu/mg/resources/handbook/MGHbook.pdf>

BMP 80: Building and Grounds Maintenance

Description

To prevent or reduce pollutant discharge to storm water from buildings and grounds maintenance, wash and clean up with as little water as possible, prevent and clean up spills immediately, keep debris from entering the storm drains, and maintain the storm water collection system. Overwatering, overfertilizing, improper herbicide or pesticide application, and improper disposal of trimmings and clippings can all contribute to serious water pollution problems (Figure 193).



Figure 193. Leaf clean up in Idaho Falls, Idaho.

General Information

Common maintenance activities generate wastes that must be properly disposed. Buildings and grounds maintenance involves landscaping, general maintenance, pest control, parking area and storm water system maintenance, and waste removal. Painting and other building repairs are covered in BMP 90.

Landscaping

- Leave or plant drought-tolerant vegetation to reduce water, fertilizer, and pesticide needs.
- Save water and prevent pollution by watering lawns sensibly. Lawns and gardens typically need the equivalent of 1 inch of rainfall per week. Overwatering to the point of runoff can carry polluting nutrients to the nearest water body.
- Conserve water by using irrigation practices such as drip irrigation, soaker hoses, or microspray systems.
- Consider planting a vegetated buffer zone adjacent to streams or other water bodies.
- Compost all yard clippings, or use them as mulch to save water and keep down weeds.
- Practice organic gardening and reduce or eliminate the need for pesticides and fertilizers.
- Pull weeds instead of spraying them.

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- | |
|---|
| ☐ Sediment |
| ☒ Nitrogen |
| ☒ Phosphorus |
| ☐ Metals |
| ☐ Bacteria |
| ☐ Hydrocarbons |
| ☐ Litter |

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Low
Ease of Installation	N/A
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

General Maintenance

- Dispose of all waters from cleaning carpets, upholstery, and other surfaces into the sink or toilet and not the street or storm drain.
- Water from pressure washing decks, driveways, roofs, or other hard surfaces may contain suspended solids and other pollutants that should not be directly discharged to drainage systems. Redirect pressure washing wastewater to vegetated areas or areas such as gravel, lawns, landscaping, or bare soil for infiltration. If this cannot be accomplished, filter the washwater through filter fabric or other filtering media to collect the suspended solids before discharging the water to a drainage system. Remove filter fabric upon completion and dispose of it in the trash.
- If chemicals are used during the pressure-washing process, the wastewater should be collected and disposed of in a sanitary sewer system or discharged to a landscaped area where it can infiltrate on site.
- Sweep parking lots, storage areas, driveways, and sidewalks monthly to collect dust, waste, and debris. Avoid hosing down the area to a storm drain.
- Dispose of washwater, sweepings, and sediments properly. Section 3.10.7 provides disposal alternatives.
- Ensure that rooftop drains drain directly to an on-site storm drain system or a grass-covered area.

Safe Substitutes for Pest Control

Pest control should be done in a safe manner to prevent washing pesticides into the storm water system and causing water pollution. Some environmentally safe substitutes for pesticides include the following:

- Garden aphids and mites—Mix 1 tablespoon of liquid soap and 1 cup of vegetable oil. Add 1 teaspoon of this mixture to a cup of water and spray. (Oil may harm vegetable plants in the cabbage family.)
- Caterpillars—When caterpillars are eating, apply products containing *Bacillus thuringiensis* to leaves.
- Ants—Place boric acid powder or hydramethylnon baits in problem areas, cracks, and insect walkways. It is a mild poison, so ensure it is inaccessible to children and pets.
- Roaches—Apply boric acid powder to cracks and entry points (see ants above). Place bay leaves on pantry shelves.

Parking Area and Storm Sewer Maintenance

Evaluate any parking area that drains to the same storm drain system for suitable BMPs. Sweeping the parking area periodically and cleaning the catch basins (if they are part of the drainage system) are suitable BMPs. A vacuum sweeper is the best method of sweeping, rather than mechanical brush sweeping. Mechanical brush sweeping does not remove fine particulates as effectively as a vacuum sweeper.

Catch basins in parking lots generally need to be cleaned every 6 to 12 months, or whenever the holding tank is one-half full. A holding tank that is more than one-half full is not effective at removing additional particulate pollutants from the storm water. If the storm drain lines have a low

gradient, (less than 0.5 feet in elevation drop per 100 feet of line), material may settle in the lines during small, frequent storms. If the storm drain system has not been cleaned recently, check the lines. If the lines are not cleaned, the catch basins will likely fill up (during the next significant storm) with material washed from the lines. Install *turn-down* elbows or similar devices on the outlets of the catch basins to retain floatables or oil and grease.

Sediments from parking areas and storm sewer maintenance are generally low in metals and other pollutants. To ensure that metals or other pollutants are not present, the material should be tested. If contaminant concentrations are high, use other BMPs to eliminate or reduce pollutants.

Using a vacuum truck to clean the storm drain system will generate dirty water, so disposed of the water properly.

Clearly mark the storm drain inlets, either with a color code (to distinguish from process water inlets if present) or with a painted stencil. The stencil should read “DO NOT DUMP WASTE.” Ensuring that storm drain inlets are clearly marked reduces inadvertent dumping of liquid wastes.

Waste Removal

For a quick reference on disposal alternatives for specific wastes, see section 3.10.7.

- Compost piles should be located on an unpaved area where runoff can soak into the ground or be filtered by grass and other vegetation. Compost piles should be located in an area of the property not prone to water ponding during storms and kept well away from wetlands, streams, lakes, and other drainage paths.
- Avoid putting hazardous or nondecomposable waste in the pile.
- Cover the compost pile to keep storm water from washing nutrients into waterways and to keep excess water from cooling down the pile, which will slow down the rate of decomposition.
- Build bins of wood, chicken wire or fencing material to contain compost so it cannot be washed away. Building a small earthen dike around a compost pile is an effective means of preventing nutrient-rich compost drainage from reaching storm water paths.
- Do not blow or rake leaves into the street, gutter, or storm drains. Never dispose of grass clippings or other vegetation in or near storm drains, streams, or lakes.
- In communities with curbside yard waste recycling, place clippings and pruning waste in approved containers for pickup, or take clippings to a landfill that composts yard waste.

BMP 82: Equipment Yard Design Features

Description

Equipment yards storing vehicles and equipment can generate wastes, such as solvents, antifreeze, oils, and greases, from cleaning and maintenance activities or improperly maintained equipment. Properly designed equipment yards control storm water pollution by reducing or eliminating polluted runoff from contaminating storm water and preventing unnecessary run-on of storm water onto the site (Figure 195).

Spill prevention controls (BMP 46) and on-site personnel training (BMP 91) should also be implemented in equipment yards.



Figure 195. Equipment yard during construction of the Salmon River Road, Riggins, Idaho.

Applicability

These design features apply to all equipment yards, both temporary construction and permanent facilities, and wherever vehicles or equipment are stored, cleaned, maintained, or fueled.

Limitations

A large area may be required for structural equipment yard BMPs to accommodate proper grading, berming, or segregated service areas. If the equipment yard cannot be designed properly, consider storing equipment off site in a more suitable location.

Design Basis

Ideally, equipment storage, maintenance, and process areas should be covered and the area around it graded to drain away from the building or covered area.

- The roof cover option used at a given site is subject to the site layout, available space, affordability, and limitations imposed by other regulations. Examples of storage options include, but are not limited to, the following:

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

●	Sediment
○	Phosphorus
◐	Metals
○	Bacteria
◐	Hydrocarbons
○	Litter

Other BMP Considerations

Relative Cost	\$\$
Maintenance Requirements	Medium
Ease of Installation	Medium
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

- A prefabricated storage shed to enclose and cover materials (ensure these structures meet applicable building and fire codes).
- A lean-to structure against an existing building to cover materials and prevent contact with rain.
- A stand-alone canopy that provides cover but no walls.

If the equipment yard cannot be covered, the following recommendations minimize storm water run-on and runoff from the area:

- Grade the equipment yard to drain to a longitudinal drain or install curbs or berms to direct all storm water to a central collection point in the yard and then to the sanitary sewer according to applicable industrial pretreatment requirement and approval of the sewer authority.
- Consider paving the surface with concrete in areas where asphalt may react with spilled liquids (BMP 46: Spill Prevention and Control).
- Provide BMPs such as an oil and water separators (BMP 15) if there is the possibility for oil to be released. All sites should implement source controls (BMP 46).
- Segregate the area where vehicles are serviced and install special permanent controls:
 - Drain the area to a single collection point, preferably connected to a holding tank. Consult with a professional engineer for proper sizing of the holding tank for the required design storm. The drain may require an oil and water separators (BMP 15) or sand and grease trap and should be approved by local regulatory authorities.
 - Grade the activity area higher than the parking lot or surround the activity area with a berm, curb, or dike to prevent storm water run-on.
 - Construct a special area that segregates the *dirtiest* equipment (e.g., roof tar and asphalt paving equipment) from other equipment. Use berms, curbs, or dikes to keep discharges, leaks, and runoff separate from other activity areas.

Maintenance

- Regularly maintain oil and water separators and sand and grease traps.
- Periodically inspect equipment yard pavement, berming, and curbing for gaps or cracks, and repair immediately.

Additional Resources

CASQA California Stormwater Quality Association. 2004. *California Stormwater Best Management Practices Handbook: New Development and Redevelopment*. Menlo Park, CA. <http://www.casqa.org/>

Washington State Department of Ecology. 2012. *Stormwater Management Manual for Western Washington*. Lacey, WA. Publ. 12-10-030.
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

BMP 83: Vehicle and Equipment Refueling

Description

BMPs for transferring fuel to vehicles, equipment, or storage tanks prevent storm water pollution from heavy metals, toxic materials, and oil and grease (Figure 196). Controlling the source of contaminants is particularly important because these contaminants are not easily removed by other storm water treatment controls. Source control can be provided through careful design of the initial fuel storage area, retrofitting existing installations, and using proper spill control and cleanup procedures.



Figure 196. Mobile fueling truck (ITD 2014).

Ideally, vehicles and equipment used on construction sites would use permanent, off-site refueling stations because these stations are usually better equipped to handle fuel spills according to local, state, and federal regulations. If off-site facilities cannot be used, properly designed fleet or equipment fueling areas can control storm water pollution by reducing or eliminating pollutants entering storm water.

Applicability

This BMP applies to both temporary fueling facilities for construction sites and permanent commercial or industrial fueling facilities. Construction sites often use either mobile refuelers or aboveground storage tanks with secondary containment. Mobile fueling, also known as fleet fueling, wet fueling, or wet hosing, is the practice of filling vehicle fuel tanks using tank trucks that are driven to the yards or sites where the vehicles to be fueled are located. BMP 77 provides more information on secondary containment and outdoor storage of liquid materials.

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- ☐ Sediment
- ☐ Phosphorus
- ☒ Metals
- ☐ Bacteria
- ☒ Hydrocarbons
- ☐ Litter

Other BMP Considerations

Relative Cost	\$\$
Maintenance Requirements	Medium
Ease of Installation	Easy
Freeze/Thaw Resistance	NA
Max. Tributary Drainage Area	NA
Max. Upstream Slope	NA
NRCS Soil Group	NA
Min. Ground Water Separation	NA
Min. Bedrock Separation	NA

Limitations

Retrofitting existing fueling areas to minimize storm water exposure or spill runoff is more difficult than using good design and initially installing fueling areas that incorporate storm water BMPs.

Maintenance is critical for proper functioning of oil and water separators.

Design Basis

Vehicle and Equipment Fueling Design Features

- Cover the fueling area to prevent rain from falling directly on the activity area. The cover's minimum dimensions should be equal to or greater than the area within the grade break or the fuel dispensing area to ensure adequate coverage.
- Equip the storm drain and sewer inlets that drain the fueling area with a shutoff valve to keep fuel out of the drain in the event of a fuel spill. Keep the valve closed at all times except during rain events where no contamination is present. Curtail fueling activities when the shutoff valve should be open, or use a large drip pan under the vehicle to capture any spilled fuel.
- Separate the fueling area from the rest of the facility, not only to contain any fuel spills, but also to prevent storm water run-on. Select from the following drainage design guidelines:
 - Grade the fueling area so it is either *mounded* or elevated. A mounded grading scheme is recommended.
 - Grade the entire fueling area to drain to a single collection point inlet. Design the grading to prevent run-on.
 - Install high berms around the area to redirect water from a large storm to a single collection point inlet.
 - Install a holding tank where accumulated liquids can be pumped.
 - Pave the fueling area with concrete rather than asphalt; asphalt can react with or absorb gasoline and other materials.
 - Apply a suitable sealant to protect the asphalt from spilled fuels in areas where covering the asphalt is not feasible and the fuel island is surrounded by pavement.
 - Install an oil and water separator (BMP 15) to collect spills if a dead-end holding tank is not used.
 - Install vapor recovery nozzles to control drips as well as air pollution.

Spill Management and Reporting

- Prepare an emergency response plan with designated personnel available on site or on call to properly implement and manage spills (BMP 46).
- Keep appropriate absorbents on hand and convenient to fueling areas.
- Report uncontrolled spills to local agencies such as the local police department or fire department.
- Report significant spills into a water body to the National Response Center at (800) 424-8802.

Designated Fueling Area

For facilities with large amounts of mobile equipment that currently use a mobile fuel truck to fuel the equipment, consider establishing a designated fueling area. Except for tracked equipment, such as bulldozers or small forklifts, most vehicles can travel to a designated area with little lost time. Place temporary *caps*, such as a bentonite mat or a spill mat, over nearby catch basins or manhole covers to prevent spilled fluid from entering the storm drain. Upon fueling is completed, remove the mat and dispose as hazardous waste.

The following spill control measures (BMP 46) reduce spilling or reduce the loss of spilled fuels from the site:

- Discourage *topping off* vehicle fuel or underground storage tanks. Topping off tanks increases the risk of spilling fuel onto the ground.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Store and maintain appropriate spill cleanup materials in a location known to all employees near the fueling operation; ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Use absorbent materials on small spills. Remove the absorbent materials promptly and dispose as hazardous waste.
- Obey all federal and state requirements for both underground and aboveground storage tanks.
- Avoid mobile fueling of industrial equipment around the facility; transport the equipment to designated fueling areas.
- Train employees in proper fueling procedures.
- Do not leave fueling operations unattended.

Maintenance

- Using a qualified professional, periodically test aboveground and belowground tanks for integrity.
- Inspect and maintain holding tanks, oil and water separators, and on-site treatment or recycling units regularly.
- Inspect the holding tank regularly to ensure it is not overfilled.
- Test holding tank contents before discharge or disposal.
- Inspect and maintain berms, curbs, dikes, or slopes regularly.
- Regularly clean oil and water separators at the appropriate intervals.
- Keep ample supplies of spill cleanup materials on site.
- Inspect fueling areas and storage tanks regularly.
- Repair and patch berms as needed.

Additional Resources

CASQA (California Stormwater Quality Association). 2015. *California Stormwater Best Management Practices Handbook: Construction*. Menlo Park, CA. <http://www.casqa.org/>

EPA (US Environmental Protection Agency). 2012. *EPA Construction General Permit*. National Pollutant Discharge Elimination System Stormwater Program.
<http://www.epa.gov/npdes/stormwater-discharges-construction-activities#overview>

EPA (US Environmental Protection Agency). 2020. *Municipal Vehicle Fueling*.
<https://www.epa.gov/npdes/oil-and-gas-stormwater-permitting#undefined>

ITD (Idaho Transportation Department). 2014. *Best Management Practices*. Boise, ID: ITD.

King County (King County, Washington). 2009. *King County, Washington Surface Water Design Manual*. Seattle, WA: King County, Department of Natural Resources.

BMP 84: Vehicle and Equipment Cleaning, Maintenance, and Repair

Description

Proper vehicle and equipment cleaning, maintenance, and repair procedures prevent pollutants, heavy metals, and toxic materials from entering ground water and surface water supplies and creating public health and environmental risks (Figure 197). Wastes often generated by cleaning, maintenance, and repair activities include, but are not limited to the following:

- Solvents
- Antifreeze
- Brake fluids
- Batteries
- Motor oils
- Fuels
- Lubrication greases



Figure 197. Vehicle maintenance prevents pollution.

Applicability

This BMP applies in all locations where vehicle and equipment cleaning, maintenance, and repair take place with a focus on permanent facilities, such as auto repair shops, industrial facilities, fleet storage facilities, and residential homes. BMP 47: Construction Equipment Washing and Maintenance provides information on temporary facilities located on construction sites.

Limitations

Many common vehicle maintenance and washing routines contribute to environmental pollution. Businesses that are unable to comply with the following guidelines should have their vehicles washed at a commercial establishment or mobile washer that conforms to these specifications.

Vehicle and equipment cleaning, maintenance, and repair can generate significant pollutant concentrations and may require permitting,

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

●	Sediment
○	Phosphorus
◐	Metals
○	Bacteria
◐	Hydrocarbons
○	Litter

Other BMP Considerations

Relative Cost	\$\$
Maintenance Requirements	Medium
Ease of Installation	Medium
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

monitoring, pretreatment, and inspections. Contact local wastewater treatment plant staff for additional information and the appropriate local authority to guarantee compliance with local standards.

Space and time limitations may preclude all work being conducted indoors.

Training is a key aspect of this BMP—ensure employees are trained to properly to prevent spills and leaks.

Design Basis

Vehicle and Equipment Cleaning

Washing vehicles and equipment outdoors or in areas where washwater flows onto the ground can pollute storm water and ground water due to the presence of diesel, gasoline, hydraulic fluid, or oil residues in the washwater. Facilities that wash or steam clean a large number of vehicles or equipment should consider contracting this work to a commercial business, which is generally better equipped to handle and dispose of washwater properly. Contracting out this work can also be economical because it eliminates the need for a separate washing/cleaning operation.

Steam cleaning and washing should be conducted on site only if the site is equipped to capture all the water and other wastes. If washing/cleaning must occur on site, wash vehicles in a designated area. Direct liquid to designated areas where it can be pretreated to remove pollutants before discharge to the sanitary sewer.

Disposal Site Options

Storm Drain—Discharges from vehicle and equipment cleaning, maintenance and repair activities should never be directed to storm drains. In areas designated for cleaning, maintenance, and repair activities, stencil “DO NOT DUMP WASTE” on the storm drain inlets.

Sanitary Sewer—Pump into sanitary system cleanout/sink or into an on-site private sanitary sewer manhole; verify with the facility manager that it is not a storm drain manhole. Solids separation will be required before disposal to prevent clogging the system.

Landscape or Soil Area—Discharge should be directed to an area sufficient to contain all the water. (Note: Be aware that soapy washwater may degrade habitat and adversely affect landscaping). The area should be used for minimum discharge flows only. Repetitive use of the same area or excessive wash volume to the same area may be illegal. Discuss discharge practices with property owner.

If disposal to the sanitary sewer and/or to a landscaped area is not possible, contract with a company capable of hauling the washwater off site to an authorized disposal site.

Designated Wash Areas

The designated wash areas must provide the following:

- Clearly labeled
- Paved with concrete
- Covered and contained to prevent contact with storm water
- Sloped for washwater collection
- Connected to the sanitary sewer or to a dead-end holding tank
- Equipped with an oil and water separator
- Allowable to rinse down the body of a vehicle with just cold water without implementing any BMPs

Several proprietary products are commercially available that enable runoff collection.

Some unavoidable evaporation may occur from paved surfaces. If a significant amount of washwater runoff evaporates at the site before it can be collected, and the site is routinely used for this purpose, the paved area itself should be cleaned every 6 months, or at the end of the wash service contract, whichever comes first. Any washwater used during this procedure should be collected and discharged to a sanitary sewer.

Cleaning and Degreasing Engines, Equipment, and Auto and Truck Drive Trains

It is likely that pollutants (petroleum products and metals) from engine-cleaning activities are concentrated in these washwaters, so the local wastewater treatment plant will require treatment before discharge into the sanitary sewer. Contact the local wastewater treatment plant for requirements and additional information.

If a sanitary sewer is not available or treatment of the washwater is not feasible, contact a company capable of hauling (i.e., tanker truck) the washwater off site to dispose at an authorized site.

Household Automobile Washing

- Wash your car directly over a vegetated or pervious area or ensure the washwater drains to a vegetated or pervious area, which allows the water and soap to soak into the ground instead of running off into a local water body.
- Ideally, no soap or detergent should be used, but if you do use one, select one without phosphates.
- Sweep driveways and street gutters before washing vehicles to cleanup dirt, leaves, trash, and other materials that may flow to the storm drain along with your washwater. This practice reduces storm drain maintenance costs and protects water quality.
- Use commercially available products that allow you to clean a vehicle without water. Developed for areas where water is scarce, these products save water and reduce pollution.
- Use a nozzle on the hose to save water.
- Do not wash your car if rain is expected.
- Consider not washing your car at home. Use a commercial car wash with a recycle system that discharges wastewater to the sanitary sewer for treatment.

Vehicle and Equipment Maintenance and Repair

Vehicle or equipment maintenance and repair is a potentially significant source of storm water pollution. Activities that can contaminate storm water include engine repair and service (e.g., parts cleaning, spilled fuel, and oil), fluid replacement, and outdoor equipment storage and parking (leaking engines). When performing maintenance and repair, the following practices should be addressed:

- Keep equipment and the equipment yard clean; ensure oil and grease accumulations do not build up excessively.
- Ensure incoming vehicles are checked for oil and fluid leaks.
- Use a properly sized drip pan underneath leaking vehicles and equipment when storing vehicles or performing maintenance. Drain pans (usually 1 x 1 foot) are generally too small to contain certain equipment fluids, such as antifreeze. Drip pans (3x 3 feet) may have to be purchased or fabricated when needed.
- Store idle equipment under cover.
- Inspect equipment for leaks on a regular basis, particularly vehicles parked or stored long term.
- Use an indoor garage or vehicle maintenance area designed to prevent storm water pollution. Avoid changing motor oil or performing equipment maintenance in inappropriate areas.
- Recycle greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic fluids, and transmission fluids. Collect and store these recyclable materials separately in secondary containment.
- Ensure oil filters are completely drained for at least 24 hours before recycling or disposing of them.
- Do not pour materials down storm drains or hose down work areas; sweep work areas instead.
- Use rags for small spills, a damp mop for general cleanup, and dry absorbent materials for larger spills. Avoid hosing down areas. Dry floor-cleaning methods may not be sufficient for some spills (BMP 46).
- Clean equipment yard storm drain inlets regularly and especially after large storms.
- Train employees in spill prevention and cleanup procedures.
- Store cracked batteries in a nonleaking secondary container, even if all the acid has drained out. If a battery is dropped, treat it as if it is cracked and store it in a containment area until you are sure it is not leaking.

Waste Reduction

- Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane, or methylene chloride. Dispose of these cleaners as hazardous waste.
- Clean without using liquid cleaning products (e.g., using a wire brush) whenever possible to reduce hazardous waste.
- Use liquid cleaners at a centralized station so the solvents and residues stay in one area.
- Locate properly sized drip pans, drip boards, and drying racks to direct drips back into a solvent tank or fluid-holding tank for reuse.

Safer Alternatives

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials:

- Use noncaustic detergents instead of caustic cleaning agents for parts cleaning (ask your supplier about alternative cleaning agents).
- Use phosphorus free cleaners whenever possible.
- Use detergent-based or water-based cleaning systems in place of organic solvent degreasers.
- Replace toxic solvents with nontoxic solvents.
- Choose recyclable cleaning agents.
- Reduce the number of solvents used to make recycling easier and lower hazardous waste management costs. Often, one solvent can perform a job as well as two solvents.

Interior Shop Area Cleaning

When possible, follow these shop area cleaning BMPs:

- Do not hose down the shop floor into streets or parking lots. Dry sweep regularly.
- Use nontoxic cleaning products. Baking soda paste works well on battery heads, cable clamps and chrome; mix the soda with a mild, biodegradable dishwashing soap to clean wheels and tires; for windows, mix white vinegar or lemon juice with water.
- To reduce or eliminate waste, fix sources of drips or leaks where possible. Routinely inspect the engine compartment, and regularly replace worn seals on equipment.
- To avoid or control spills and leaks:
 - Prepare and use easy to find spill containment and cleanup kits. Include safety equipment and cleanup materials appropriate to the type and quantity of materials that could spill.
 - Pour kitty litter, sawdust, or cornmeal on spills.
 - Change fluids carefully. Use a drip pan to avoid spills. Prevent fluid leaks from stored vehicles. Drain fluids such as unused gas, transmission and hydraulic oil, brake and radiator fluid from vehicles or parts kept in storage. Simple work practices reduce the chance of spills.
 - Use a funnel to pour liquids (like lubricants or motor oil) and place a tray underneath to catch spills. Place drip pans under the spouts of liquid storage containers. Clean up spills immediately.
 - See BMP 46: Spill Prevention and Control for more information.

Household Automobile Maintenance

- Recycle all oils, antifreeze, solvents, and batteries. Many local car parts dealers and gas stations accept used oil. A household hazardous waste facility in your area may accept oil, oil filters, antifreeze, and solvents. Some communities and counties hold household hazardous waste turn-in days that will accept car wastes including old batteries. Old batteries can be worth money, so call battery shops find out if they purchase used batteries.

- Never dump new or used automotive fluids or solvents on the ground, in a storm drain or street gutter, or in a water body. Eventually, the waste will make its way to local surface waters or ground water, including the water we drink.
- Do not mix wastes. The chlorinated solvents in some carburetor cleaners can contaminate a huge tank of used oil, rendering it unsuitable for recycling. Keep wastes in separate containers, label properly, and store them out of the weather.
- To dispose of a used oil filter, punch a hole in the top and let it drain for 24 hours. A large funnel in the top of the oil storage container comes in handy for draining. After draining the filter, wrap it in two layers of plastic and dispose of it in your regular garbage or recycle at a local household hazardous waste facility if one is available.
- Use care in draining and collecting antifreeze to prevent accidental spills. Spilled antifreeze can be deadly to cats and dogs that ingest it.
- Perform service activities on concrete or asphalt or over a plastic tarp to make spill cleanup easier. Keep a bag of kitty litter available to absorb spills. If a spill occurs, sprinkle a layer of absorbent on the spill, let it absorb for a while, and then sweep it up. Place the contaminated litter in a plastic bag, tie it up, and dispose in the regular garbage. Do not leave kitty litter in the rain as it is difficult to clean up.
- For outside autobody work, use a tarp to catch material from grinding, sanding, and painting. Double bag the waste in plastic and place it in the garbage.

Reporting

Report uncontrolled spills to the local police or fire departments. A significant spill into a water body should be reported to the National Response Center at (800) 424-8802.

Maintenance

- Inspections shall be conducted as required by the NPDES permit or contract specifications.
- BMPs should be inspected weekly, before rain events, daily during rain events, and after rain events.
- Inspect and maintain berms, curbs, dikes, or slopes regularly.
- Regularly clean oil and water separators at the appropriate intervals.
- Keep ample supplies of spill cleanup materials on-site.
- Inspect and maintain holding tanks, oil and water separators, and on-site treatment or recycling units regularly.

Additional Resources

CASQA (California Stormwater Quality Association). 2015. *California Stormwater Best Management Practices Handbook: Construction*. Menlo Park, CA. <http://www.casqa.org/>

EPA (US Environmental Protection Agency). 2012. *EPA Construction General Permit*. National Pollutant Discharge Elimination System Stormwater Program. <http://www.epa.gov/npdes/stormwater-discharges-construction-activities#overview>

- EPA (US Environmental Protection Agency). 2017. *Municipal Vehicle and Equipment Maintenance*. <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater-documents>
- EPA (US Environmental Protection Agency). 2017. *Menu of BMPs: Municipal Vehicle and Equipment Washing*. https://www3.epa.gov/npdes/pubs/sector_s_airtransmaint.pdf
- ITD (Idaho Transportation Department). 2014. *Best Management Practices*. Boise, ID: ITD.

BMP 86: Nonstorm Water Discharges to Drains

Description

Nonstorm water discharge can occur via an illicit connection, which is any nonapproved physical connection to a publicly maintained storm drain system, or via illegal dumping into a storm drain (Figure 204). Nonstorm water discharges may be composed of solids or liquids that have not been permitted by the public entity responsible for operating and maintaining the storm water system. Facilities subject to EPA storm water permit regulations may be required to certify that the storm water collection system has been tested or evaluated for the presence of nonstorm water discharges.



Figure 204. Messages on storm drain inlets can prevent illicit discharges.

Nonstorm water discharges to the storm water collection system may include any water used directly in the manufacturing process (process wastewater), used motor oil, radiator coolant, antifreeze, outdoor secondary containment water, vehicle and equipment washwater, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters. Section 3.10.7 “Construction Disposal Alternatives” provides more information on properly disposing materials.

Applicability

This BMP applies to all storm water management systems. Nonstorm water discharges may happen at any time during the life of a system and reporting such discharges should occur whenever discovered.

While nonstorm water discharge control measures are usually implemented by municipal governments, they may also be relevant to campus-scale developments, private homeowner associations, or industrial operations.

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- Sediment
- ◐ Phosphorus
- ◐ Metals
- Bacteria
- ◐ Hydrocarbons
- ◐ Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Medium
Ease of Installation	Easy
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Limitations

- Many facilities do not have accurate, up-to-date schematic drawings of existing drainage networks and associated contributing areas, which makes evaluating the system difficult.
- Video or visual inspections can identify illicit connections to the storm sewer, but further testing is sometimes required (e.g., dye, smoke, and laboratory testing) to identify sources.

Design Basis

Practice guidelines for preventing nonstorm water discharges to drains include three general categories: identification, eliminating illicit connections, and public education. Proper spill prevention, control, and response measures (BMP 46) are important for preventing storm water contamination from accidental spills. Using an integrated municipal storm water and wastewater planning approach can prevent illicit connections and facilitate sustainable and comprehensive solutions that protect human health and improve water quality. See EPA's Integrated Municipal Storm Water and Wastewater Planning at <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-storm-water-documents>.

Identify Nonstorm Water Discharges

The following approaches may identify nonstorm water discharges or illicit connections to a storm water system:

- **On-site inspection**—Inspect each discharge point during dry weather. While on site, review both visual factors (i.e., staining or unusual colors in runoff, traces of oil, excessive sediment, and abnormally high flow) and any unusual odors present at the outfall. Storm water runoff may continue for 3 days or more after an event, and ground water may infiltrate into the underground storm water collection system. Understand these drainage aspects in addition to base flow conditions when visually assessing a system.
- **Field survey**—Inspect the contributing drainage area for structures, buildings, industrial areas, and impervious surfaces located near the nonstorm water discharge location. Note where these contributing areas join the storm drain system in question.
- **Piping schematic review**—Review *as-built* piping schematics for all systems to determine if there are any connections to the storm water collection system. The piping schematic is a map of pipes and drainage systems used to carry wastewater, cooling water, and sanitary wastes. Drawings may need to be obtained from a variety of sources, such as municipalities, state agencies, and city and county building departments.
- **Smoke testing**—Use smoke testing of wastewater and storm water collection systems to detect connections between the two systems. During dry weather, the storm water collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates a possible connection between the sanitary and the storm water systems.
- **Dye testing**—Perform a dye test by releasing a dye into either the sanitary or process wastewater system and examine the discharge points from the storm water collection system for the dye color.
- **Video inspection**—Use mobile video cameras remotely through storm water system lines to observe possible illicit connections into storm water systems. Public works staff can observe and record the videos and note any visible illegal connections.

- **Laboratory testing**—Sample water quality for high levels of fecal coliform, petroleum hydrocarbons, or other contaminants to determine the source of the nonstorm water discharge. Follow appropriate sampling standards to ensure accurate results.

Eliminate Illicit Connections

- If illicit connections are identified, promptly notify the owner of the illicit connection or discharge incidents at the time of discovery and remove the nonstorm water discharge. Prevent any new illicit connections by identifying where the appropriate connection should be made or what disposal alternative is available.
- Replumb sewer lines and properly connect the lines to the sanitary sewer system if applicable.
- Isolate problem areas from the storm water system.
- Plug illicit discharge points.
- Document that nonstorm water discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.

The following can prevent any new illicit connections:

- Ensure that existing building and plumbing codes prohibit physical connections of nonstorm water discharges to the storm drain system.
- Have a permit program in place to review and approve any proposed connection into a storm sewer.
- Require visual inspection of new developments or redevelopments during the construction phase to ensure that proper plumbing connections are implemented. Train field inspectors and develop field inspection procedures that prevent new illicit connections of sanitary sewer lines to storm sewers.

Public Education

Public education and awareness reduce illegal dumping and some types of illicit discharges. For example, many citizens may not be aware that storm water systems drain to streams rather than wastewater treatment plants or may not be aware of the environmental damage caused by discharging soapy water, pet waste, and other household wastes into the storm system. Developing a public outreach strategy is a key aspect in meeting the minimum measures for public education and public involvement required by MS4 permits. Per the EPA minimum measure, MS4 entities must complete the following:

- Distribute educational materials to the community or
- Conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

Public outreach strategies must reach the following:

- Public agencies and officials
- Program managers, inspectors, and municipal employees
- Business and industry owners and operators
- Nongovernmental organizations and volunteers
- Students, citizens, and the general public

Outreach is used to increase awareness and education, or inspire action. A good campaign is tailored to a selected audience, addresses current practices, and motivates change. Local governments should choose those public awareness and education approaches most effective for their communities and the intended audiences:

- Enact and publicize information from ordinances that prohibit illegal dumping and illicit connections. Many local governments already have such ordinances; however, citizens are often unaware of them. Publicity, including news articles, door hangers, utility bill inserts, radio or TV advertisements, or website highlights, increase awareness. These efforts are particularly effective when connected to a specific water quality problem such as a nearby stream or lake impairments due to bacteria and/or nutrients.
- Community-based social marketing programs can effectively invoke change through social pressure. Social marketing can be used to understand the audience, develop an effective message, and get the message out.
- Use storm drain stenciling of messages, such as “No Dumping - Drains to Stream/River/Lake,” on storm drains to discourage dumping directly into the storm drain.
- Provide citizens with readily available contact information to report illegal dumping. Install a *hotline* telephone number to handle calls from citizens reporting illegal dumping or accidental spills.
- Create brochures and other guidance related to illegal discharges to the storm drain. Educational efforts should alert business owners that nonstorm water discharges are not allowed and provide guidance on BMPs to implement. For example, power washing discharges are process wastewater that may not be discharged to the storm sewer system. When power washing is conducted, storm drain inlet protection, wet vacuuming, collection systems, and/or other appropriate measures to prevent washwater from entering the storm drain system should be implemented.
- Provide well-marked proper disposal or collection sites for wastewater.
- Provide information on proper disposal of hazardous waste and local programs for hazardous waste collection or drop-off.
- Employee training (BMP 91) should especially emphasize proper disposal of nonstorm water discharges.

Maintenance

Periodically inspect and maintain storm drain inlets, especially those with a history of illicit connections. Clean out catch basins so that accumulated pollutants do not wash down the storm drains.

Additional Resources

Cunningham Environmental Consulting, 2011. *Social Marketing Strategies for Stormwater Business Outreach: Summary of Recent Research in the Puget Sound Region: Assistance for Developing and Implementing Local Programs*. Bainbridge Island, WA.

EPA (US Environmental Protection Agency). 2010. *Getting in Step: A Guide for Conducting Watershed Outreach Campaigns* 3rd ed. Washington, DC: Office of Water. EPA 841-B-10-002. <http://cfpub.epa.gov/npstbx/files/getnstepguide.pdf>

EPA (US Environmental Protection Agency). 2011. *Nonpoint Source (NPS) Outreach Toolbox*.
<http://cfpub.epa.gov/npstbx/>

Washington State Department of Ecology. 2012. *Stormwater Management Manual for Western Washington*. Lacey, WA. Publ. 12-10-030.
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

BMP 91: Employee Training

Description

Employee training ensures proper installation, maintenance, and subsequent operational success of storm water BMPs. In-house employee training programs are established to teach employees about storm water management, potential contaminant sources, and BMPs (Figure 209).

Programs should provide personnel with an understanding of SWPPP for municipal facilities or construction sites as appropriate. Cover BMP operation and maintenance, safety hazards, practices for preventing discharges, and procedures for responding quickly and properly to toxic and hazardous material incidents.



Figure 209. Employee meeting in Valley County, Idaho (*Midas Gold*).

Applicability

Employees directly involved in storm water activities or potentially polluting activities should receive general storm water and targeted BMP training tailored to their activities. Training should include municipal employees, construction personnel and supervisors, and commercial or industrial operators who oversee storm water BMPs. Education all staff, regardless of field responsibilities, about general storm water awareness and detection of illicit discharges.

Limitations

Common challenges an employee training program may encounter include the following:

- Lack of commitment from senior management
- Poor communication between all parties involved
- Lack of employee motivation
- Lack of incentive to become involved in BMP implementation

Primary BMP Functions and Controls

☒ Construction	☒ Permanent
☐ Erosion Control	☐ Sediment Control
☒ Source Control	☐ Flood Control
☐ Filtration	☐ Infiltration

Typical Effectiveness for Targeted Pollutants

- Sediment
- Phosphorus
- Metals
- Bacteria
- Hydrocarbons
- Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Easy
Ease of Implementation	Easy
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	N/A
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Approaches and Best Management Practices

The following are specific criteria for implementing an employee training program:

- Ensure strong commitment and periodic input from senior management.
- Communicate frequently to ensure adequate understanding of the storm water management plan goals and objectives.
- Use experience from past spills to prevent future spills.
- Make employees aware of BMP monitoring and spill reporting procedures.
- Develop operating manuals and standard procedures.
- Continue education in an on-going, yearly process.

An employee training program should be an on-going, yearly process. Typically, training combines formal classroom-style programs held on an annual basis with more frequent weekly *tailgate* meetings held on site and covering general project updates and short BMP training sessions. Consider the following training suggestions:

- Integrate storm water training with existing training programs that are required for your business or municipality by other regulations such as the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard (29 CFR 1910.120) and SPCC plan (40 CFR 112). Many commercial and industrial facilities have employee training programs that address health- and safety-related issues. Training on storm water management and BMPs can and should be incorporated into these programs.
- In Section 3.10.7, “Construction Disposal Alternatives,” use Table 11 to train employees in proper and consistent methods for disposing of materials.
- Check employees’ work practices periodically to ensure BMPs are properly implemented. Post informational and reminder signs in common work areas and stencil “DO NOT DUMP WASTE” messages on storm drains.
- Be aware that site owners are also responsible for customer activities. Ask customers to avoid discarding liquids into trashcans or liquids or solids into storm drains.
- Employ ongoing education through
 - Posters and bulletin boards
 - Employee meetings and training courses
 - Field training programs followed by a discussion of site-specific BMPs by trained personnel

Maintenance

After training, managers should periodically check the employees work to ensure that BMPs are being installed and maintained properly. Ensure facility SWPPP and BMP guidance documents are available to employees after training is completed.

Additional Resources

CASQA California Stormwater Quality Association. 2004. *California Stormwater Best Management Practices Handbook: New Development and Redevelopment*. Menlo Park, CA. <http://www.casqa.org/>

- EPA (US Environmental Protection Agency). 1999. *Employee Training*. Stormwater Management Fact Sheet. <http://www3.epa.gov/npdes/pubs/empltrng.pdf>
- EPA (US Environmental Protection Agency). 2015. *Municipal Employee Training and Education*. National Pollutant Discharge Elimination System (NPDES). <https://www.epa.gov/npdes/tmdl-npdes-permits-training-user-guides>

Appendix 6

2024 Public Education, Outreach and Involvement Program

Attachment 1

2024 Public Education, Outreach and Involvement Program

1. Overview

The City of Boise, Ada County Highway District, Garden City, Ada County Drainage District #3, Idaho Transportation Department District #3, and Boise State University formed Partners for Clean Water (Partners) to develop a cooperative approach to educating the public on stormwater and water quality issues and ensure compliance with the Permit. The City of Boise is the lead agency for this control measure of the Permit with support from the other Partners. The overarching goal of the program is to educate the public on stormwater issues to change specific behaviors that contribute to nutrient, bacteria, temperature, and sediment pollution to the MS4 and local receiving waters.

The City's Stormwater Public Education and Outreach Program is guided by a step-by-step process when developing educational opportunities.

1. Define goals and desired outcomes
2. Identify and analyze target audiences
3. Create messaging for selected audiences
4. Distribute message through chosen methods of outreach
5. Assess the results in order to direct future efforts

The Partners conduct multiple outreach activities and messaging campaigns each year, designed to reach the various target audiences identified in the Permit and focus on stormwater issues of significance in the Permit area. The permittees collaborate each year on which topics and relevant messages the program will focus their efforts on. These activities and messages are further developed and built upon based on feedback and public participation.

Target audiences in Permit Year 3 included the general public, businesses, homeowners, neighborhood associations, pet owners, landscapers, property managers, engineers, contractors, developers, plan review staff, and students. Specific details that meet Permit Part 3.1 requirements can be found below.

2. Ongoing Efforts (throughout Permit term):

Annual Media Campaign

The Partners continue to participate in an annual media campaign which utilize messaging opportunities with radio advertisements, public service announcements, and online ads. The media campaign reaches all target audiences with general messages on water quality with a focus on pet waste, fertilizer reduction, and illicit discharge reporting in 2024.

Manuals and Reference Materials

Manuals, fact sheets and other education and outreach reference materials are available on the Partners for Clean Water [website](#). These materials are targeted, based on content, to all our targeted audiences. Examples of

these documents include 'Stormwater Facility Maintenance Best Management Practices', 'Stormwater Pollution Prevention: Commercial Landscaping', 'Operation and Maintenance of Stormwater Systems', 'Drainage Plan Checklist' and 'Stormwater Management Resource Guide', among others.

Website

The website (partnersforcleanwater.org) reaches all target audiences with specific messaging based on audience. More information can be found in section 7 below.

Boise WaterShed Environmental Education Center

The Boise WaterShed Environmental Education Center opened in May, 2008, and is designed to promote water stewardship by teaching people of all ages how to protect and conserve our precious resources for future generations.

The staff at the Boise WaterShed incorporates stormwater pollution prevention and stormwater management information into the programs, water renewal facility tours, and lessons offered to visitors. Education of personal impacts to water quality via stormwater, wastewater and pollution prevention tips are integrated throughout most exhibits, lessons, tours, and the center's library resources. Partners staff participate in events at the WaterShed, including WaterShed Weekends, Earth Day events, and summer programs.

The facility also provides an outdoor River Campus which presents a new dimension to water education with exterior exhibits that show the big picture of the Treasure Valley's water resources. Presented to simulate the workings of the Lower Boise Watershed, the interactive, walk-able, park-like setting takes visitors on a journey from Lucky Peak Reservoir and Dam, through Boise's urban streets, and the Water Renewal Facility. From here they watch cleaned water returned to the Boise River and see it flow downstream to the agricultural zone that sustains our food industry. Ultimately, visitors realize that what we do upstream not only affects downstream users, but also ultimately the overall health of the Snake River.

The Boise WaterShed is transforming into the nation's first climate and water science center. The all-ages, hands-on exhibits will explore themes of our changing watershed and how the community can take action to help make our community more resilient to the effects of climate change. The Boise Watershed is undergoing renovations and was closed during Permit Year 3. Limited programming was available through on-site K-12 lessons, homeschool

days, models and kits available for checking out, and other events. Stormwater education is included in this programming.

Social Media

The City of Boise and other Partners regularly posts messaging on Twitter, Facebook, and Instagram regarding stormwater, water quality, household hazardous waste collection, leaf litter pick up information, etc. to help distribute these messages to the community through a variety of avenues.

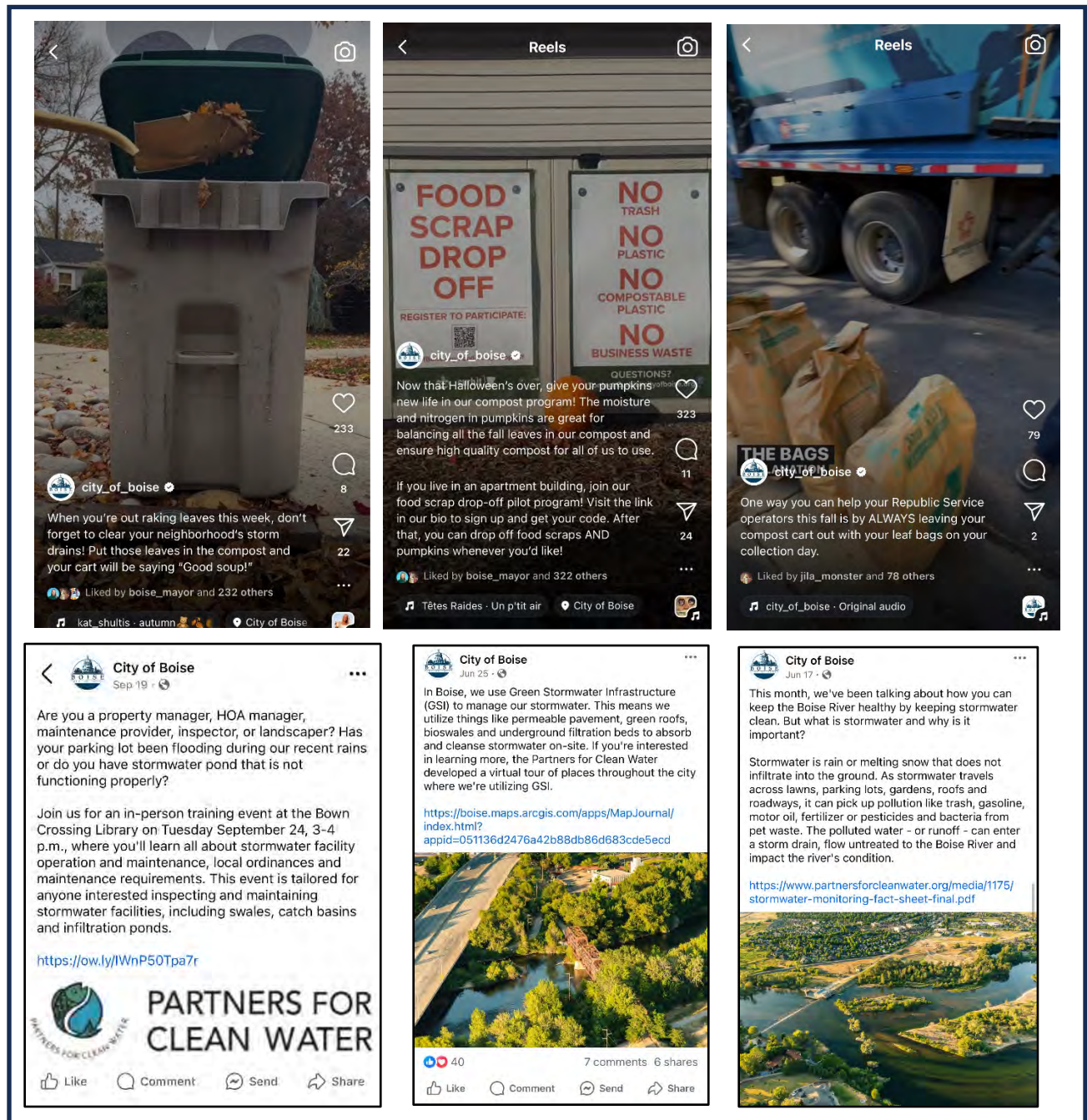


Figure 1. Examples of 2024 educational social media posts

3. 2024 Outreach Events and Activities:

Media Campaign

The media campaign for 2024 included radio ads, social media posts, and online ads on websites such as BoiseDev and KTVB.

Themes highlighted in 2024 include picking up pet waste, illicit discharge reporting, and proper fertilizer use, seen in Figure 2 below.



Figure 2. 2024 Stormwater Educational Graphics

Around 450 radio ads were aired on radio stations including KJOT, KRVB, KXLT, KKKO, KIZN, KKGL, LA GRAND, and LA PONDEROSA. Radio ads were broadcast in English and Spanish.

Bus Wrap

Partners coordinated with Valley Regional Transit to create a stormwater educational bus wrap to display on a regional bus from May through August. This was a general stormwater message to help people understand that stormwater flows directly to our waterways. The stormwater hotline number was also listed on the bus to report illegal dumping into storm drains. Posters were also present on the interior of the bus.



Figure 3. 2024 Bus Wrap

2024 Events

Several events were held during Permit Year 3 for stormwater education and outreach purposes. Each event targeted the general public and focused on general stormwater awareness, illicit discharge reporting, stormwater pollution prevention tips for homes and businesses, and water quality.

1. City of Boise Earth Day:



2. Neighborhood Concert Series:



3. National Night Out



4. Assessment

The Partners are consistently assessing the public's understanding of our public outreach messages and the adoption of behaviors that reduce stormwater pollution by our target audiences.

Assessment includes surveys at events that measure general stormwater knowledge to evaluate which topics are being conveyed already, and which topics need additional messaging and awareness. These surveys also resolve which media avenues are most useful to the respondents to guide our outreach in the future.

Data from website usage, radio ads, and billboard viewership is also used to assess which programs and messages are reaching the most people. The Partners website is updated based on which pages are most viewed and clicked on, in order to make popular topics more accessible (Appendix A).

The results of these continual assessments constantly shape the future of our public outreach and education programming. Focus will be given to programs that are successful in changing the public's behaviors and practices to reduce stormwater pollution.

A more targeted pilot program was started in Permit Year 2 in the Central Rim Neighborhood. The primary goal of this pilot project is to increase stormwater awareness, engage the target audience, and effectively promote proper leaf disposal. By isolating public education and outreach in this neighborhood, we are aiming to achieve higher participation in proper leaf disposal in the Central Rim Neighborhood.

In October 2023, postcards were sent out that outlined the benefits of raking your leaves such as flooding prevention and improved water quality. It also gave instructions for leaf pickup and provided a link to sign up for a free yard sign to encourage neighbors to rake leaves. Signs were displayed in the yards of Central Rim Neighborhood residents.



Figure 4. Outreach postcard sent to Central Rim Neighborhood residents

Outreach continued in 2024 at the Central Rim's National Night Out. More signs were given to residents and stormwater educational messaging and post cards were provided at a Partners for Clean Water table. Many residents exhibited enthusiasm and interest in the program.

In 2025, we will send out another post-outreach survey to the Central Rim Neighborhood to evaluate the behaviors surrounding leaf collection for the pilot neighborhood. We will compare post-outreach survey results from the Central Rim

neighborhood to other neighborhoods that did not receive targeted outreach; this will allow us to assess the effectiveness of the outreach conducted. We will also compare Central Rim leaf collection data from 2021-2024 to measure if more leaves were collected from this neighborhood after outreach was conducted. This will provide estimates of self-reported behavior changes as well as leaf volume data from Republic Services to show behavior changes.

More information regarding the pilot program, follow-up outreach, and conclusions will be available in the Permit Year 4 Annual Report.

5. Tracking

A tracking spreadsheet is used by the City of Boise to track and maintain all records of our stormwater education and outreach activities, events, and trainings. This spreadsheet is shared with other permittees during regularly scheduled permittee meetings and is open to feedback and discussion. The tracking spreadsheet is used to compile the annual report.

6. Education on SWMP Control Measures

Construction Site Runoff Control Training

To provide the regional construction community with erosion and sediment control and stormwater pollution prevention education, the City and our Partners have developed the Erosion and Sediment Control (ESC) Responsible Person (RP) training and certification program. The class promotes awareness of the impact of polluted construction site runoff and soil erosion on the MS4 and the Boise River. The class curriculum covers local and state stormwater regulations, principles of ESC Best Management Practices (BMPs), installation and maintenance of common erosion and sediment controls, fugitive dust control, stormwater pollution prevention practices, dewatering, how to conduct the required construction site inspections and updating the ESC plan or SWPPP for the site.

The instructors for the City Responsible Person classes must be qualified and approved by the City. Instructors are required to submit a resume to the City detailing their educational history and experience in erosion control. They must also be able to demonstrate knowledge of the principles of erosion; sediment transport; erosion and sediment control technology, implementation, and maintenance; and local and federal ordinances regulating erosion and sediment control.

Courses are offered through third party entities: Engineering with a Mission LLC, Eagle One LLC, Jones Erosion Control, the College of Western Idaho, and Syman Company throughout the year in various locations in the Treasure Valley as well as online offerings. Boise State University's Construction

Management Program also presents the class material to their students, who may receive certification if desired. Additionally, the Nampa school district has a vocational construction site program that utilizes the ESC training presentation. The ESC Inspectors also present the RP course quarterly to train local agency personnel involved in construction projects so that they may implement BMPs on public projects and notify ESC Inspectors if they see runoff pollution and other violations at construction sites. As part of the training participants receive education materials including an illustrated ESC Field Guide to Best Management Practices specific to Idaho.

Construction site operators and contractors must renew their RP certification every 3 years by attending the training and passing an examination. The class is updated regularly to present new ideas and methods in ESC and SWPPP. The Planning and Development permitting system maintains a database of certified RPs. The database is utilized by the City of Boise, ACHD, Garden City, the City of Nampa, and City of Caldwell to verify that construction sites have an individual with ESC training onsite. The RP name and contact information is required to be listed prior to permit issuance, and the RP must have operational control to make corrective actions and knowledge to implement BMPs and work with ESC Inspectors to keep sites in compliance.

In 2024, 853 Responsible Person licenses were issued or renewed.

City staff provide ongoing awareness, education and outreach through the website, annual events, and also can provide site specific training as needed to interested parties and industry groups.

Permanent Stormwater Controls Training

The Partners conducted a permanent stormwater controls training in September 2024. The goal of this training is to provide guidance to local audiences on the operation and maintenance activities required to be performed on various stormwater facilities. The training emphasized the importance of maintaining stormwater facilities to prevent stormwater pollution. It covered local ordinances, O&M requirements, and context for property O&M agreements.



Figure 5. 2023 Permanent SW Control ad

7. Publicly Accessible Website

The City of Boise, on behalf of the Partners for Clean Water, maintains a website that educates the public on stormwater issues for multiple audiences. The website is a key source for stormwater information in Boise and the Treasure Valley.

The website contains relevant contacts for each permittee, as well as each permittee's annual reports, SWMPs, and other relevant compliance and regulation materials. The Intergovernmental Agreement (IGA) that outlines permittee responsibilities is posted, as well as the IPDES permit and the MS4 map. Regularly scheduled permittee meeting agendas and meeting notes are also posted.

The website has topics for varying target audiences, such as homeowners, pet owners, engineers, surveyors, developers, mobile businesses, landscapers, and property maintenance companies. Manuals, checklists, fact sheets and guidance documents are organized into the target audience's respective pages. Individual permittee sites are also linked for more information. Information regarding training,

events, and other topics pertinent to educating the community on how to reduce stormwater pollution is easily accessible.

The website continues to be an important way to educate our target audiences and provide a central location for public education and permit compliance information. The Partners continuously develop new outreach materials to post on the website and hand out at events. QR codes that link to the Partners website are often printed on outreach materials.

Appendix A

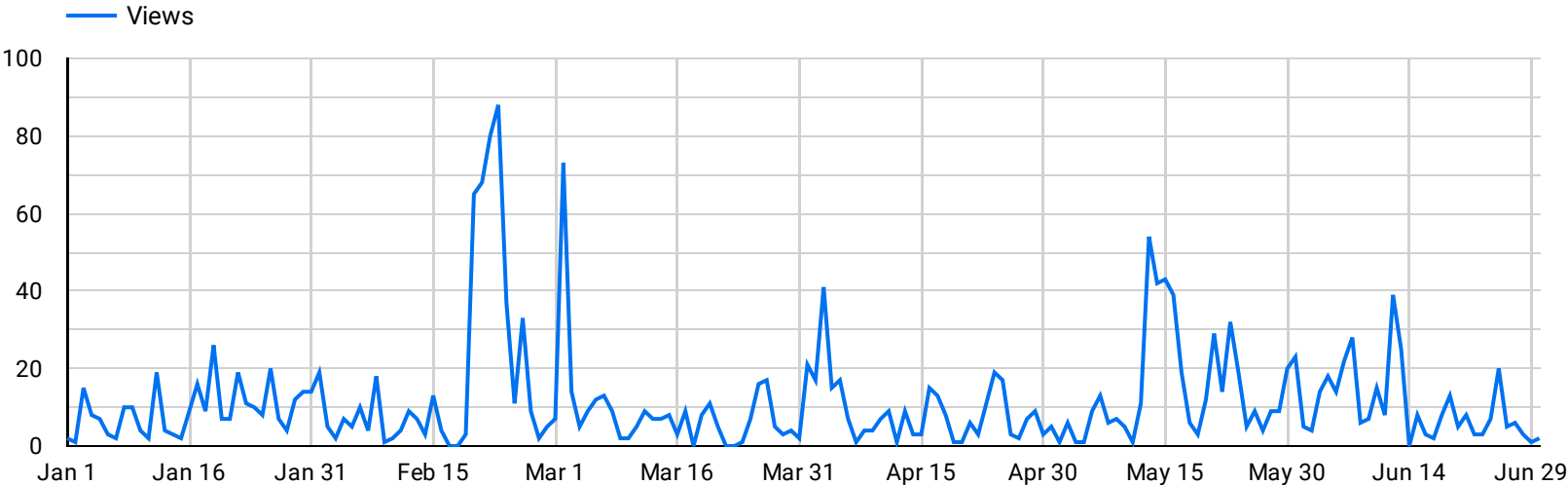
Website data

Partners for Clean Water - 2024 Report

January - June (Google Analytics 4)

Total users 2,146	Views 22,449	Average session duration 00:01:08	Bounce rate 73.77%	Views per session 12.45

Session source / medium	Views ▾	Average session duration	Bounce rate
1. (direct) / (none)			
2. BoiseDev / Display			
3. google / organic			
4. news.grets.store / re...			
5. cityofboise.org / refe...			
6. rida.tokyo / referral			
7. bing / organic			
8. static.seders.websit...			
9. kar.razas.site / refr...			
10. info.seders.website / ...			
11. duckduckgo / organic			
12. In the Know Newslet...			
13. cityofcaldwell.org / r...			
14. trast.mantero.online...			
15. ofer.bartikus.site / re...			
16. game.fertuk.site / re...			
17. baidu / organic			
18. garold.dertus.site / r...			
19. app.asana.com / ref...			
20. Others			
Grand total	2,123	00:01:09	73.53%



Partners for Clean Water - 2024 Report

January - June (Google Analytics 4)

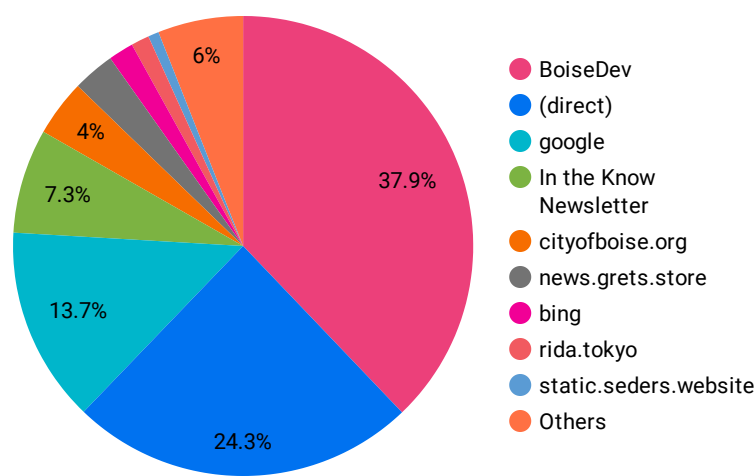
Views Per Page

	Page title	Views ▾
1.	Partners for Clean Water	895
2.	Partners for Clean Water	416
3.	Gophers Partners for Clean Water	155
4.	General Information Partners for Clean Wa...	97
5.	Report an Issue Partners for Clean Water	85
6.	City of Boise Partners for Clean Water	66
7.	Landscaping, Gardening and Home Mainten...	49
8.	Drainage District #3 Partners for Clean Wa...	48
9.	Annual Report Partners for Clean Water	41
1...	Partners for Clean Water Meetings Partner...	33
1...	Boise State Partners for Clean Water	29
1...	ACHD Partners for Clean Water	28
1...	Contact Partners Partners for Clean Water	23
1...	Pets Partners for Clean Water	23
1...	Permit Info Partners for Clean Water	22
1...	ITD DIST #3 Partners for Clean Water	20
1...	City of Caldwell Partners for Clean Water	20
1...	Garden City Partners for Clean Water	16
1...	Roses Partners for Clean Water	10
2...	Construction Partners for Clean Water	9

Total Users Per Landing Page

	Landing page	Total users ▾
1.	/	1.1K
2.	/residents/pest-control/gophers	143
3.	(not set)	63
4.	/report-an-issue	60
5.	/aboutpartners/city-of-boise	33
6.	/aboutpartners/drainage-district-3	28
7.	/residents/landscaping-gardening-and-ho...	24
8.	/aboutpartners/annual-report	18
9.	/aboutpartners/boise-state	15
10.	/residents/general-information	15
11.	/aboutpartners/city-of-caldwell	12
12.	/businesses/general-information	12
13.	/report-an-issue/contact-partners	12
14.	/aboutpartners/achd	11
15.	/meetings/partners-for-clean-water-meeti...	11
16.	/aboutpartners/garden-city	10
17.	/aboutpartners/permit-info	10
18.	/aboutpartners/itd-dist-3	9
19.	/residents/pets	9
20.	/residents/pest-control/roses	7
21.	/businesses/construction	6
22.	/2018-stormwater-conference-growing-ou...	3
23.	/aboutpartners/annual-report/2017-annu...	3
24.	/aboutpartners/annual-report/2020-annu...	3
25.	/aboutpartners/annual-report/2018-annu...	2
26.	/businesses/engineers-surveyors	2
27.	/residents/pest-control/aphids	2
28.	/residents/pest-control/ants	1
29.	/residents/pest-control/fleas	1
30.	/searchresults	1

Session Source



Partners for Clean Water - 2024 Report

July - December (Google Analytics 4)

Total users 2,900	Views 10,326	Average session duration 00:00:54	Bounce rate 72.84%	Views per session 3.5

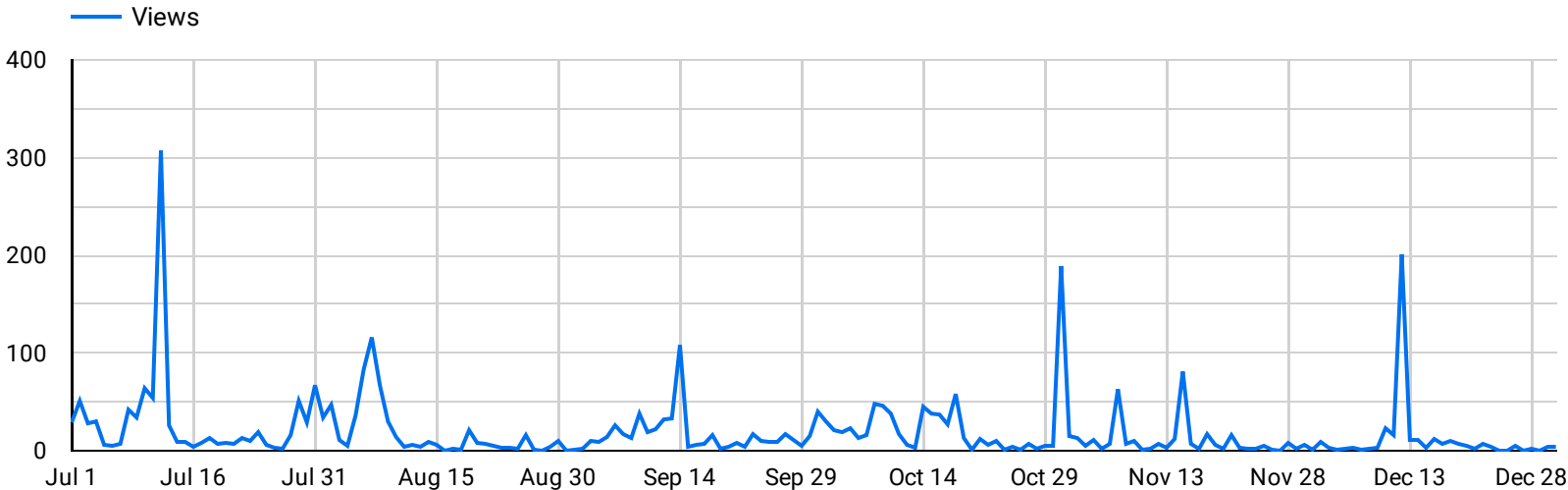
Session source / medium		Views ▾	Average session duration	Bounce rate
1.	BoiseDev / Display			
2.	(direct) / (none)			
3.	In the Know Newsletter / email			
4.	google / organic			
5.	cityofboise.org / referral			
6.	CbvffEfi / Evfcybl			
7.	bing / organic			
8.	Va guf Xabj Afjfyggfe / email			
9.	statics.teams.cdn.office.net / refe...			
10.	yahoo / organic			
11.	cityofcaldwell.org / referral			
12.	appsecadmin.cityofboise.org / re...			
13.	gbc-excel.officeapps.live.com / re...			
14.	facebook.com / referral			
15.	aimbnra.shop / referral			
16.	arcarticle.online / referral			
17.	feiacmr.shop / referral			
18.	mix106radio.com / referral			
19.	sestarblog.shop / referral			

Grand total

3,484

00:00:54

72.72%



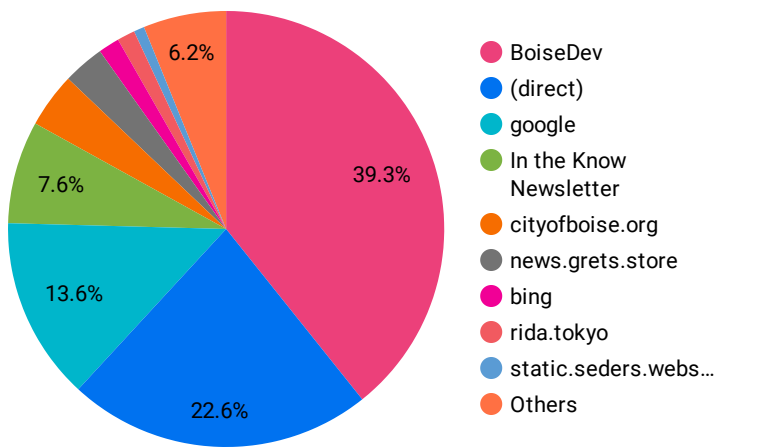
Partners for Clean Water - 2024 Report

July - December (Google Analytics 4)

Views Per Page

Page title		Views ▾
1.	Partners for Clean Water	2,095
2.	General Information Partners for Clea...	309
3.	Landscaping, Gardening and Home Mai...	268
4.	Gophers Partners for Clean Water	236
5.	Report an Issue Partners for Clean Wa...	99
6.	City of Boise Partners for Clean Water	56
7.	ACHD Partners for Clean Water	38
8.	Boise State Partners for Clean Water	38
9.	Drainage District #3 Partners for Clean...	37
1...	Pets Partners for Clean Water	35
1...	Pest Control Partners for Clean Water	34
1...	Contact Partners Partners for Clean W...	30
1...	Partners for Clean Water Meetings Par...	27
1...	Annual Report Partners for Clean Water	26
1...	Permit Info Partners for Clean Water	25
1...	ITD DIST #3 Partners for Clean Water	17
1...	City of Caldwell Partners for Clean Wa...	17
1...	Automobile Maintenance Partners for ...	17
1...	Engineers Surveyors Partners for Clea...	16
2...	Garden City Partners for Clean Water	16

Session Source



Total Users Per Landing Page

Landing page		Total users ▾
1.	/	1.9K
2.	/residents/pest-control/gophers	194
3.	/residents/general-information	166
4.	/residents/landscaping-gardening-and...	157
5.	(not set)	61
6.	/report-an-issue	57
7.	/aboutpartners/city-of-boise	40
8.	/aboutpartners/achd	25
9.	/aboutpartners/drainage-district-3	24
10.	/aboutpartners/boise-state	15
11.	/aboutpartners/city-of-caldwell	14
12.	/meetings/partners-for-clean-water-me...	14
13.	/aboutpartners/itd-dist-3	13
14.	/report-an-issue/contact-partners	13
15.	/businesses/general-information	12
16.	/aboutpartners/garden-city	11
17.	/aboutpartners/annual-report	10
18.	/aboutpartners/permit-info	10
19.	/residents/pets	10
20.	/residents/automobile-maintenance	5
21.	/residents/pest-control/aphids	4
22.	/businesses/construction	3
23.	/businesses/engineers-surveyors	3
24.	/residents/pest-control	3
25.	/residents/pest-control/fleas	3
26.	/2018-stormwater-conference-growing-...	1
27.	/aboutpartners/annual-report/2017-an...	1
28.	/aboutpartners/annual-report/2018-an...	1
29.	/residents/pest-control/ants	1
30.	/residents/pest-control/cockroaches	1
31.	/residents/pest-control/roses	1
32.	/residents/pest-control/weed-control	1

Appendix 7

Stormwater Outfall Monitoring Summary WY 2024

Stormwater Outfall Monitoring Summary

Water Year 2024

Prepared by
Brown and Caldwell

Prepared for
Ada County Highway District
December 19, 2024



This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated September 12, 2024. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Stormwater Outfall Monitoring Summary WY 2024

Ada County Highway District

12/19/2024

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1 Introduction

Ada County Highway District (ACHD), Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Permittees) were issued a third-cycle National Pollutant Discharge Elimination System (NPDES) Phase Permit #IDS027561 (Permit) on October 1, 2021. The Permit authorizes the Permittees to discharge from municipal separate storm sewer system outfalls to the Boise River and its tributaries. According to Permit Part 6.2.1, Wet Weather Stormwater Outfall Monitoring, Permittees are required to monitor wet weather stormwater discharges according to the [NPDES Phase I Stormwater Outfall Monitoring Plan](#) (ACHD, 2022). The following summary covers wet weather outfall monitoring activities during water year (WY) 2024 (October 1, 2023–September 30, 2024). WY 2024 represents the third year of monitoring under the new Permit cycle.

The Stormwater Outfall Monitoring Plan (SWOMP) was developed in line with the Quality Assurance Project Plan for NPDES Stormwater Permit Monitoring (QAPP) (ACHD, 2023) and describes the overall approach to stormwater outfall monitoring. Details about specific site characteristics, equipment, data collection and sample handling procedures, analytical methods, and quality assurance/quality control methodology are found in the SWOMP.

In WY 2024, data collection for the Stormwater Outfall Monitoring Program included precipitation, flow, and water quality samples. Four outfall monitoring sites within the Permit area (Lucky, Whitewater, Main, and Americana) were monitored for flow and water quality. The water quality samples were collected from wet weather discharges and included grab samples with corresponding field parameters and composite samples, which were collected throughout the duration of a storm. Additionally, four rain gauge sites (East, Front, Cynthia Mann, and Whitewater) were maintained to provide localized precipitation data. Each rain gauge location represents at least one of the monitored subwatersheds and was used to verify that storm criteria were met.

2 Monitoring Sites, Equipment, and Sample Type

The Stormwater Outfall Monitoring Program consists of four monitored subwatersheds: Lucky, Whitewater, Main, and Americana. Monitoring stations for each subwatershed are located near the outfalls with dedicated equipment installed at each location. Table 2-1 depicts the equipment types and referenced rain gauge site for each subwatershed. A vicinity map illustrating the location of each subwatershed, monitoring station, and rain gauge site is found in Figure 1 (Appendix A).

Table 2-1. Monitoring Station Equipment

Monitoring Site	Lucky	Whitewater	Main	Americana
Sampler type	Hach AS950	ISCO 6712	Hach AS950	ISCO 6712
Flowmeter type	Hach AV9000	ISCO Signature	Hach AV9000	ISCO Signature
Referenced rain gauge	Cynthia Mann	Whitewater	Front	Front and East
Rain gauge equipment types	Global Water tipping bucket/HOBO event logger	Hach tipping bucket/ISCO Signature	Global Water tipping bucket/HOBO event logger	Global Water tipping bucket/HOBO event logger

2.1 Sample Types

The sample types collected during WY 2024 included grab samples and composite samples. Grab samples represent a discrete measurement from the overall storm discharge while composite samples represent the entire discharge.

Grab samples were manually collected using a swing sampler. The grab samples were submitted to the Boise City Public Works Water Quality Laboratory (WQL) and analyzed for *E. coli*. At the time that the grab samples were collected, field parameters (temperature, pH, dissolved oxygen [DO], and conductivity) were measured using In-Situ smarTROLL or In-Situ AquaTROLL handheld instruments.

Composite samples were collected using automatic samplers, which worked in conjunction with flowmeters. After a predetermined volume of flow was discharged, the flowmeters triggered the samplers to collect a subsample. Each subsample was deposited into a 15-liter carboy, resulting in a flow-proportional composite sample. The composite samples were submitted to the WQL, where they were split for analysis. The following constituents were analyzed during WY 2024: biological oxygen demand, 5-day (BOD₅); chemical oxygen demand (COD); hardness as calcium carbonate (CaCO₃); turbidity; total suspended solids (TSS); total dissolved solids (TDS); total phosphorus as P(TP); orthophosphate, as P (ortho-P); ammonia, as N; nitrate + nitrite, as N; total Kjeldahl nitrogen (TKN); total arsenic; dissolved and total cadmium; dissolved copper; dissolved and total lead; total mercury; and dissolved zinc.

3 Stormwater Outfall Monitoring Results

Wet weather stormwater samples were collected according to the procedures listed in the SWOMP. One of the goals in the SWOMP is to collect three accepted (unqualified) grab and composite samples from each monitoring station during each water year. In WY 2024, samples were attempted during five storms to meet this goal. A summary of the storm dates and sample types collected is shown in Table 3-1. Storm setup and sampling information are included in Table 1 (Appendix B). Storm Event Reports were created after each stormwater sampling event to monitor the status of the SWOMP and discuss the hydrological and analytical data from the grab and composite samples. These Storm Event Reports include details about the storm and weather monitoring, hydrographs, sample collection times, and water quality results. Individual Storm Event Reports for the five sampling events during WY 2024 are included in Appendix C.

Table 3-1. Storm Events and Sample Types

Date	Lucky	Whitewater	Main	Americana
October 10, 2023	G, C ^{1, 2}	G	–	G, C ³
November 19, 2023	G, C	G, C	G, C	G ⁴ , FD, FB, C
February 1, 2024	G ⁵ , FD, FB, C	G ⁵ , C ⁶ , CD	G ⁵ , C	G ⁵ , C
February 26, 2024	G, C	G, C	G, FD, FB, C ⁷	G, C
March 28, 2024	–	C	G, FD, FB, C	G, CB

Sample types: G = grab, C = composite

QC Sample types: FD = field duplicate, FB = field blank, CD = lab duplicate/composite split, CB = field blank composite

¹ Composite sample qualified due to lack of representativeness (50%–75%).

² Incomplete water quality analysis due to low composite sample volume.

³ Composite sample qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

⁴ Incomplete field parameter collection on the grab sample data form due to field error.

⁵ *E. coli* sample qualified due to exceeded hold time.

⁶ Composite sample rejected due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented more than 10% of the composite volume.

⁷ Composite sample qualified due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented less than 10% of the composite volume.

3.1 Wet Weather Analytical Results

Field parameter results are presented in Table 2 and analytical results are presented in Table 3 (Appendix B). Graphical representation of the analytical results is provided in Figures 2–5 (Appendix A). The following assessment provides minimum and maximum measured values for WY 2024. Qualified data are included in the range of measured/reported values as well as the data analysis. Rejected data are not included in the analysis or data discussion below; however, they are presented in the tables. All measurements were recorded in accordance with QAPP and SWOMP procedures.

DO and oxygen demand

- DO ranged from 4.920 to 10.88 milligrams per liter (mg/L).
- Biological oxygen demand, 5-day (BOD₅) concentrations ranged from 5.03 to 61.9 mg/L.
- Chemical oxygen demand (COD) concentrations ranged from 39.0 to 167 mg/L.

pH, temperature, conductivity, and hardness

- pH values ranged from 5.66 to 8.27 standard units.
- Temperature ranged from 4.75 to 17.17 degrees Celsius.
- Conductivity ranged from 81.35 to 749.2 micro-siemens per centimeter.
- Hardness ranged from below the method detection limit (MDL) (< 0.100) to 102 mg/L as calcium carbonate.

Bacteria

- *E. coli* ranged from below the MDL (< 1.0) to 2,720 most probable number per 100 milliliters.

Sediment

- Turbidity ranged from 8.60 to 103 nephelometric turbidity units.
- TSS ranged from 8.63 to 131 mg/L.
- TDS ranged from 44.2 to 236 mg/L.

Nutrients

- Ammonia, as N ranged from 0.173 to 0.829 mg/L.
- Chloride ranged from 5.19 to 64.1 mg/L
- Nitrate + nitrite, as N ranged from 0.145 to 0.969 mg/L.
- TKN ranged from 0.894 to 2.43 mg/L.

Phosphorus

- TP ranged from 0.143 to 0.958 mg/L.
- Ortho-P ranged from 0.0494 to 0.768 mg/L as P.

Metals

- Total arsenic ranged from 0.66 to 5.5 micrograms per liter (µg/L).
- Dissolved cadmium ranged from below the MDL (< 0.0100) to 0.032 µg/L.
- Total cadmium ranged from 0.024 to 0.13 µg/L.
- Dissolved copper ranged from 1.9 to 8.2 µg/L.

- Dissolved lead ranged from 0.028 to 0.21 µg/L.
- Total lead ranged from 0.33 to 6.1 µg/L.
- Total mercury ranged from below the MDL (< 0.0100) to 0.0191 µg/L.
- Dissolved zinc ranged from 9.80 to 51.7 µg/L.

3.2 Monitored Event Pollutant Loading Results

Pollutant loading estimates in pounds per acre (lbs/ac) were calculated for the following constituents of concern: TSS; TP; ammonia, as N; nitrate + nitrite, as N; and TKN. The reported concentrations were combined with runoff volumes measured during the storm event at each monitoring station. Formulas that were used, including conversion factors to estimate the loading in lbs/ac, are described in the SWOMP. Table 4 (Appendix B) presents the estimated pollutant loading of the constituents for each monitored storm. The pollutant loading contributions for each site are shown graphically in Figure 6 (Appendix A). Table 5 (Appendix B) is a summary of event loading estimates in pounds per acre for comparison between monitored drainage areas. Rejected data are not included in the analysis or data discussion below; however, they are presented in the tables. A summary of the estimated ranges of pollutant loading for the storm events monitored during WY 2024 is presented below.

- TSS loading estimates ranged from 0.0400 to 3.52 lbs/ac.
- TP loading estimates ranged from 0.000617 to 0.0114 lbs/ac.
- Ammonia, as N loading estimates ranged from 0.000771 to 0.0170 lbs/ac.
- Nitrate + nitrite, as N loading estimates ranged from 0.00162 to 0.0168 lbs/ac.
- TKN loading estimates ranged from 0.00367 to 0.0453 lbs/ac.

3.3 Precipitation Results

Precipitation data from the Front, East, Cynthia Mann, and Whitewater rain gauges were used to validate all targeted storms during WY 2024. Each monitoring station is associated with a rain gauge. Precipitation data recorded for each of the targeted storms can be found in Table 1 (Appendix B). Monthly totals for WY 2024 are shown in Figure 7 (Appendix A).

4 Quality Assurance/Quality Control

Quality assurance (QA) and quality control (QC) measures for the Stormwater Outfall Monitoring Program are presented in detail in the QAPP and SWOMP. No deviations from the QAPP and SWOMP occurred during WY 2024. QA and QC measures conducted during the water year are discussed below.

4.1 Data Quality Discussion

A data validation review process was used to evaluate the analytical and field parameter results. These checklists were used to compare monitoring methods and monitoring data collected against performance criteria established to meet the data quality objectives described in the QAPP. Field parameter results and analytical results that were qualified are identified in Tables 2 and 3 (Appendix B), respectively. Further information regarding qualified samples is included in the Storm Event Reports located in Appendix C.

The following program criteria are used to identify storm events and representative composite samples.

- Storm criteria are met when the precipitation amount is greater than 0.10 inch, and the storm was preceded by a minimum 72 hours of dry weather from the previous measurable storm event (rainfall greater than 0.10 inch).

- Composite samples are considered representative of stormwater runoff when aliquots represent greater than 75 percent of total runoff volume from the storm or greater than 6 hours of the storm, including the first hour of runoff.

For WY 2024, samples collected during the following storm events were qualified for reasons discussed below:

October 10, 2023

- The composite sample collected from the Lucky monitoring station on October 10, 2023, was qualified due to lack of representativeness (50%–75%) during the storm event, as well as an incomplete water quality analysis due to low composite sample volume.
- The composite samples collected from Americana monitoring station were qualified due to lack of representativeness (50%–75%) of the calculated flow.

November 19, 2023

- The grab sample collected from the Americana monitoring station on November 19, 2023, was qualified due to incomplete field parameters, resulting from a field error.

February 1, 2024

- The grab samples collected for each monitoring station on February 1, 2024, were qualified due to *E. coli* samples exceeding hold time.

February 26, 2024

- The composite sample collected from the Main monitoring station on February 26, 2024, was qualified due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented less than 10% of the composite volume.

4.2 QC Sample Results

QC sampling during WY 2024 consisted of a combination of field QC samples, laboratory QC samples, and equipment QC samples. Field QC sampling intervals followed a predetermined schedule, included in the SWOMP. Equipment QC samples were collected during fall maintenance. Sample results for all field QC samples are included in Table 6 (Appendix B).

4.2.1 Field QC Samples

Field QC samples include field duplicates, field blanks, and composite blanks.

Field duplicates are field grab samples that were taken alongside a parent grab sample to compare the accuracy of the data. For *E. coli*, allowable logarithmic relative percent difference (RPD) between the duplicate sample and the parent sample is 40 percent, for values where the parent and duplicates are greater than 10 MPN/100mL. Due to the variability associated with extremely low numbers indicating little to no association between MPN results with a concentration of less than 10 MPN/100 mL, all sample pairs that are both less than 10 MPN/100mL will be automatically included in the database without qualifier flags. All field duplicate samples collected during WY 2024 met the RPD standard or had values below 10 MPN/100mLs.

Analytical results from field blanks and composite blanks are expected to be less than the MDL. If a water quality parameter is detected in a field blank or composite blank, all analytical results associated with the blank that exhibit a concentration of less than five times the concentration detected in the blank, are qualified. All field blank and composite blank samples collected had results less than the MDLs for the analyzed constituents.

4.2.2 Laboratory QC Samples

Laboratory QC samples are composite duplicate samples that are split at WQL. This type of sample serves as a check on the laboratory's ability to representatively split a composite sample and is a test of analytical precision. The allowable RPD for all parameters is 20 percent. All parameters from the composite duplicate sample collected during WY 2024 met the RPD standard.

4.2.3 Equipment QC Samples

Equipment QC samples include an equipment blank and a rinsate blank, both serving as a check on equipment decontamination procedures.

The equipment blank is collected before sampling for the water year begins and when new equipment is installed. For WY 2024, the equipment blanks were collected on October 2, 4, and 5, 2023, at the Main, Whitewater, Americana, and Lucky monitoring stations. Dissolved copper and dissolved zinc were detected in all blank samples. Dissolved copper results throughout the WY that are less than five times the value detected in the blank, have been qualified and are considered estimates. Dissolved zinc samples throughout the WY are unqualified for all sites. Ammonia and COD were detected in the Main blank sample. Total lead was detected in the blank at Lucky while total and dissolved lead was detected in the blank at Whitewater. However, no ammonia, COD, or total and dissolved lead samples collected throughout the WY were less than five times the value detected in the blank and are therefore unqualified. All other results were greater than five times the detected value in the equipment blank and are unqualified.

The rinsate blank is collected after sampling for the water year has been completed. The rinsate blanks for WY 2024 were collected on September 10 and 17, 2024, at the Main, Whitewater, and Americana monitoring stations. Dissolved copper was detected in all blank samples. Dissolved copper results that were collected throughout WY 2024 are less than five times the value detected in the blank have been qualified and considered estimates. Orthophosphate, as P and TSS were detected in the Whitewater and Americana blank samples, respectively, and total lead was detected in both samples. Dissolved zinc was detected in the Main and Americana blank samples. However, no orthophosphate, as P; TSS; total lead; or dissolved zinc results collected during WY 2024 were less than five times the concentration detected in the respective rinsate blanks and are therefore unqualified. All other results were greater than five times the detected value in the rinsate blank and are unqualified.

Appendix A: Figures

Figure 1. Vicinity Map

Figure 2. WY 2024 *E. coli* Results

Figure 3. WY 2024 TSS, TDS, and Turbidity Results

Figure 4. WY 2024 Ammonia, Nitrate + Nitrite, and TKN Results

Figure 5. WY 2024 Total Phosphorus and Orthophosphate Results

Figure 6. WY 2024 Pollutant Loadings

Figure 7. WY 2024 Monthly Precipitation

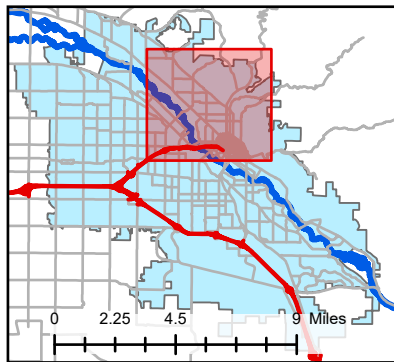
Figure 1: Vicinity Map
Phase I NPDES Outfall Sampling Stations

-  Monitoring Station
-  Rain Gauge
-  Monitoring Station and Rain Gauge

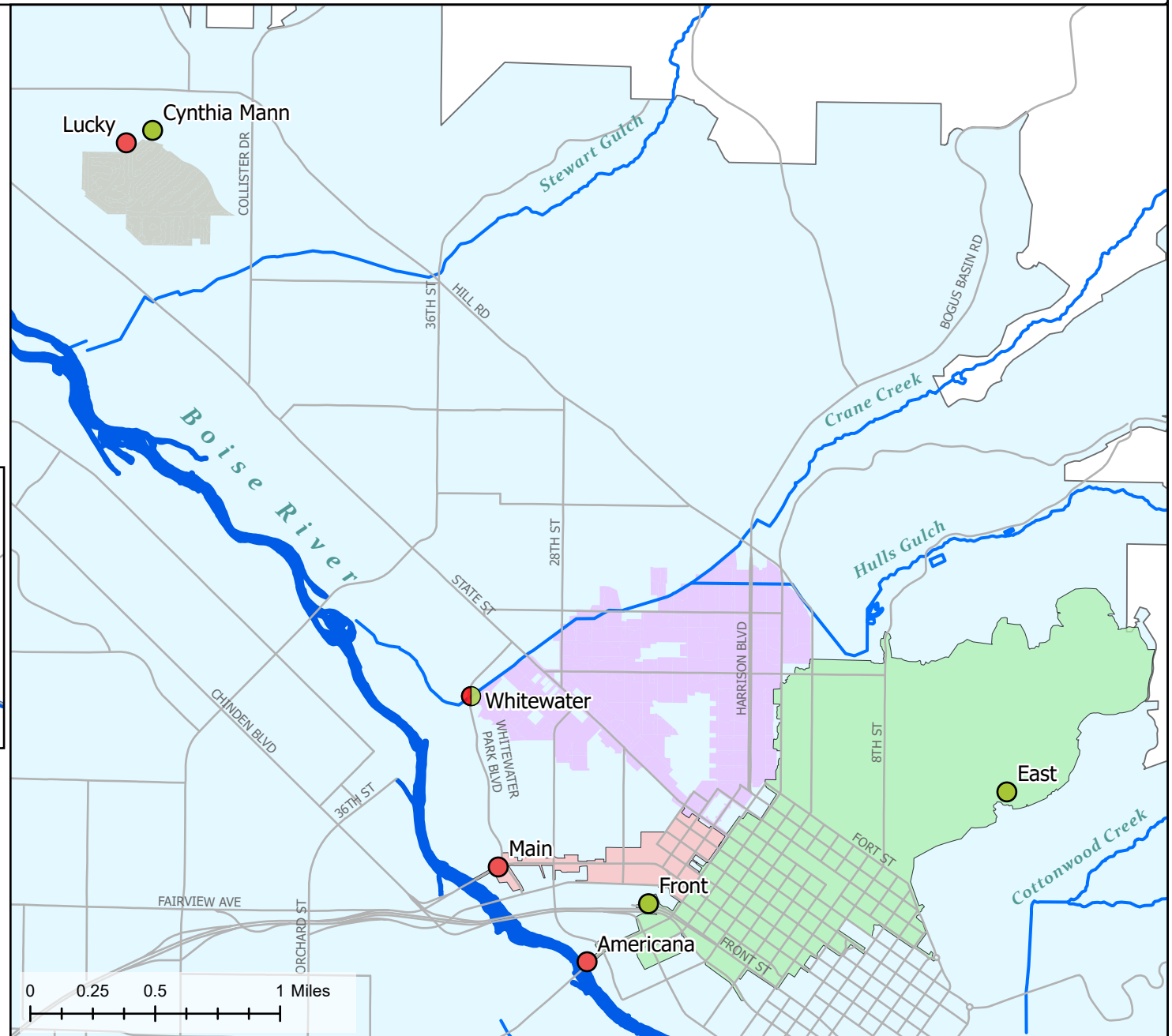
-  Interstate
-  Arterials
-  Phase I Permit Area

Subwatershed

-  Main - 79 Acres
-  Lucky - 105 Acres
-  Americana - 875 Acres
-  Whitewater - 498 Acres



Created 11/14/24



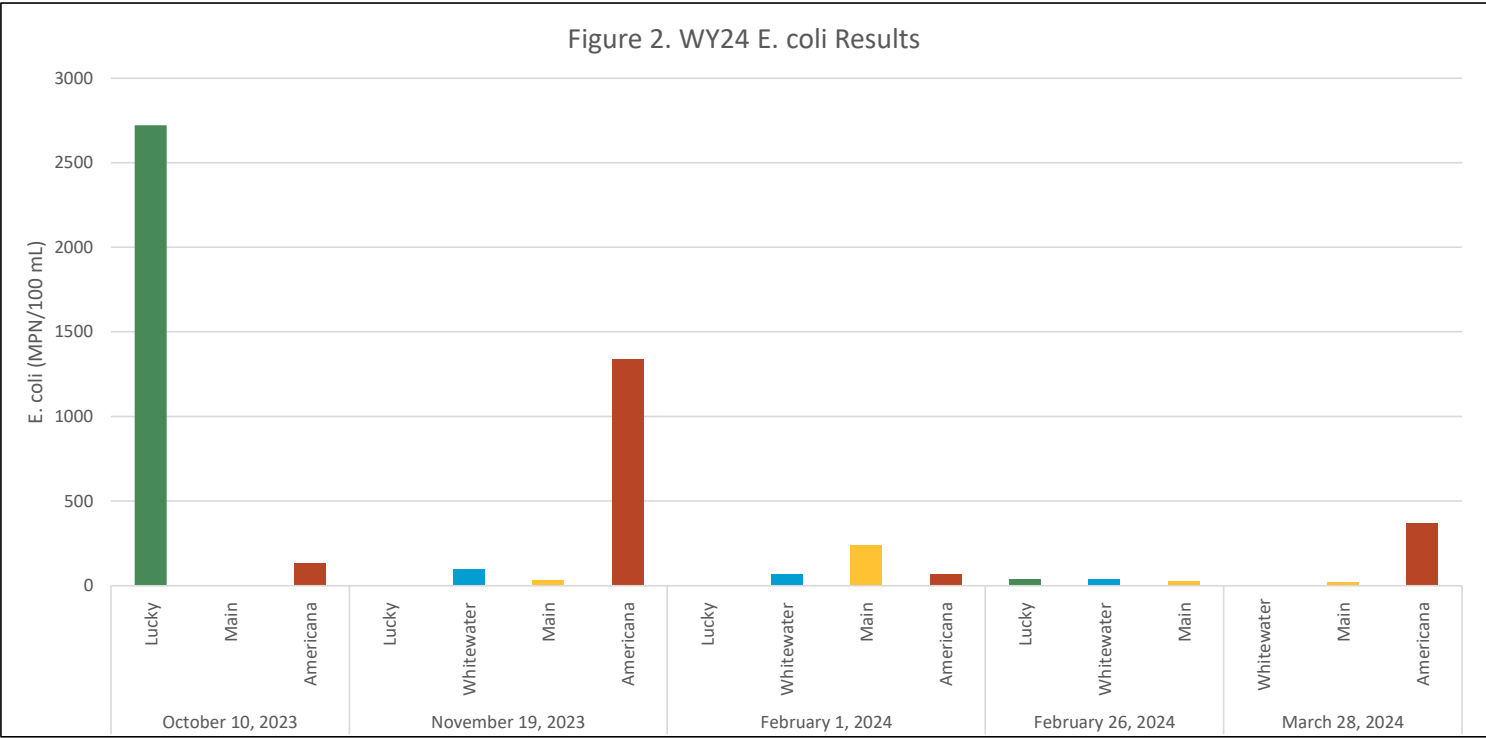


Figure 3. WY24 TSS, TDS, and Turbidity Results

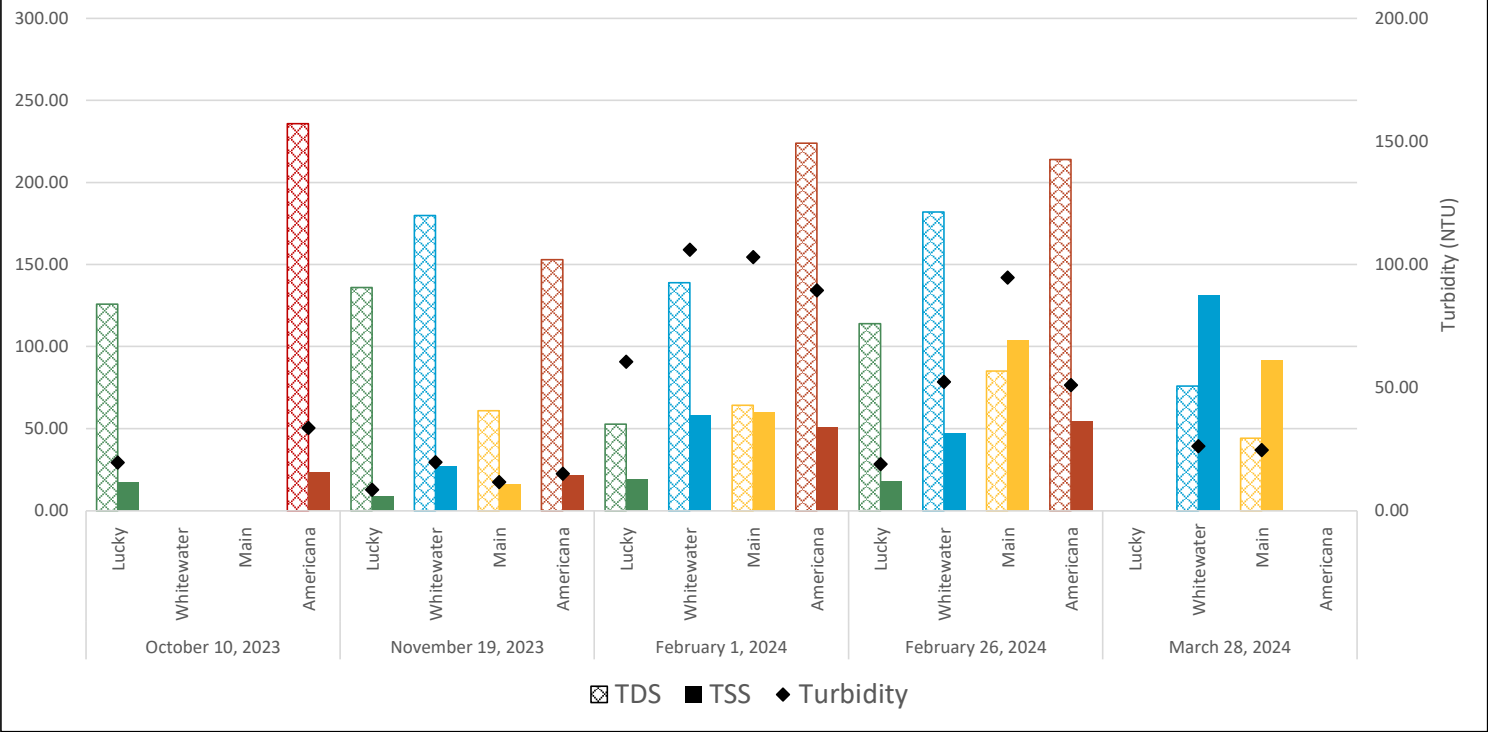


Figure 4. WY24 Nitrate + Nitrite as N, Ammonia as N, and TKN Results

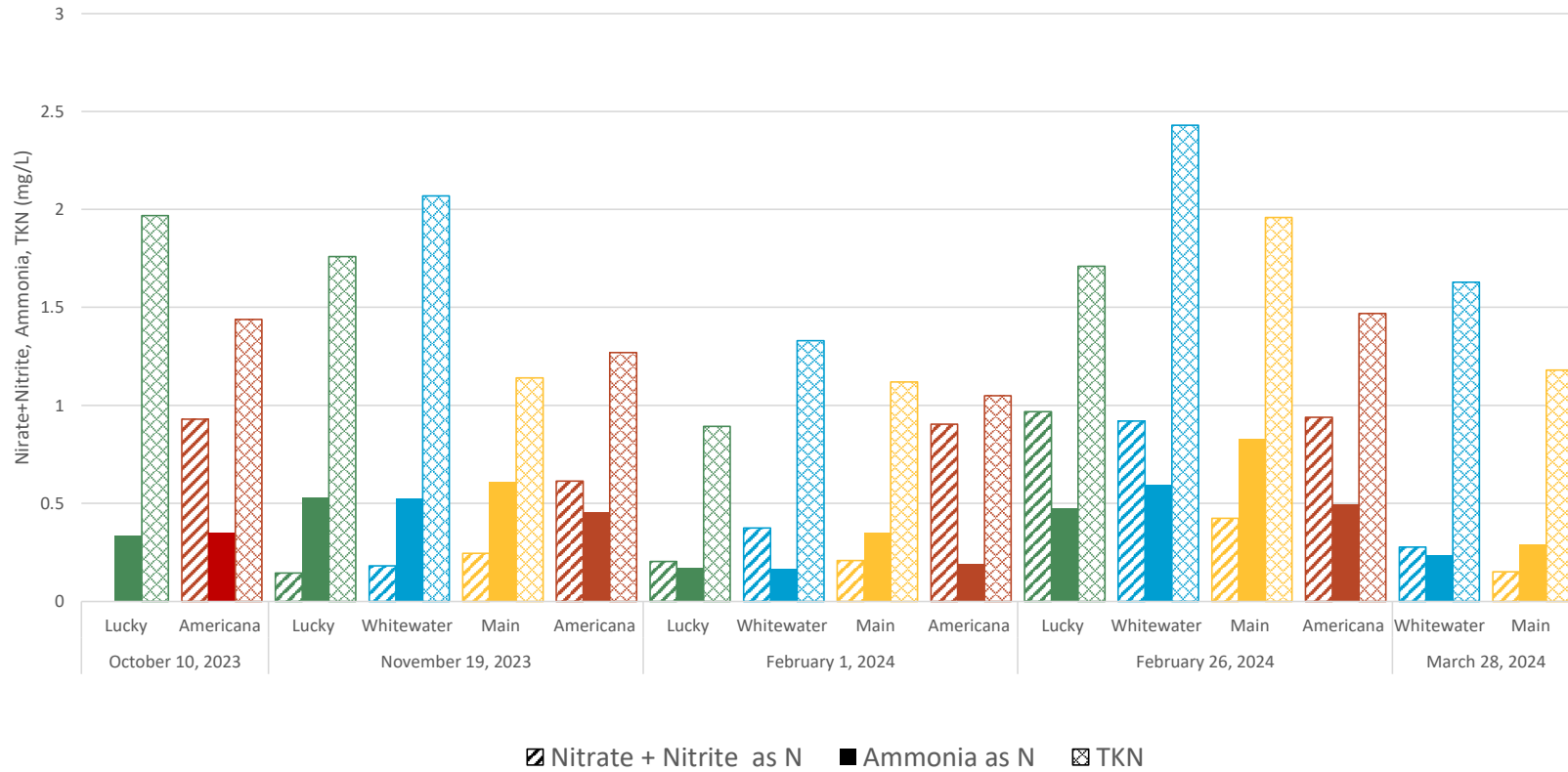


Figure 5. WY24 Total Phosphorus and Orthophosphate as P

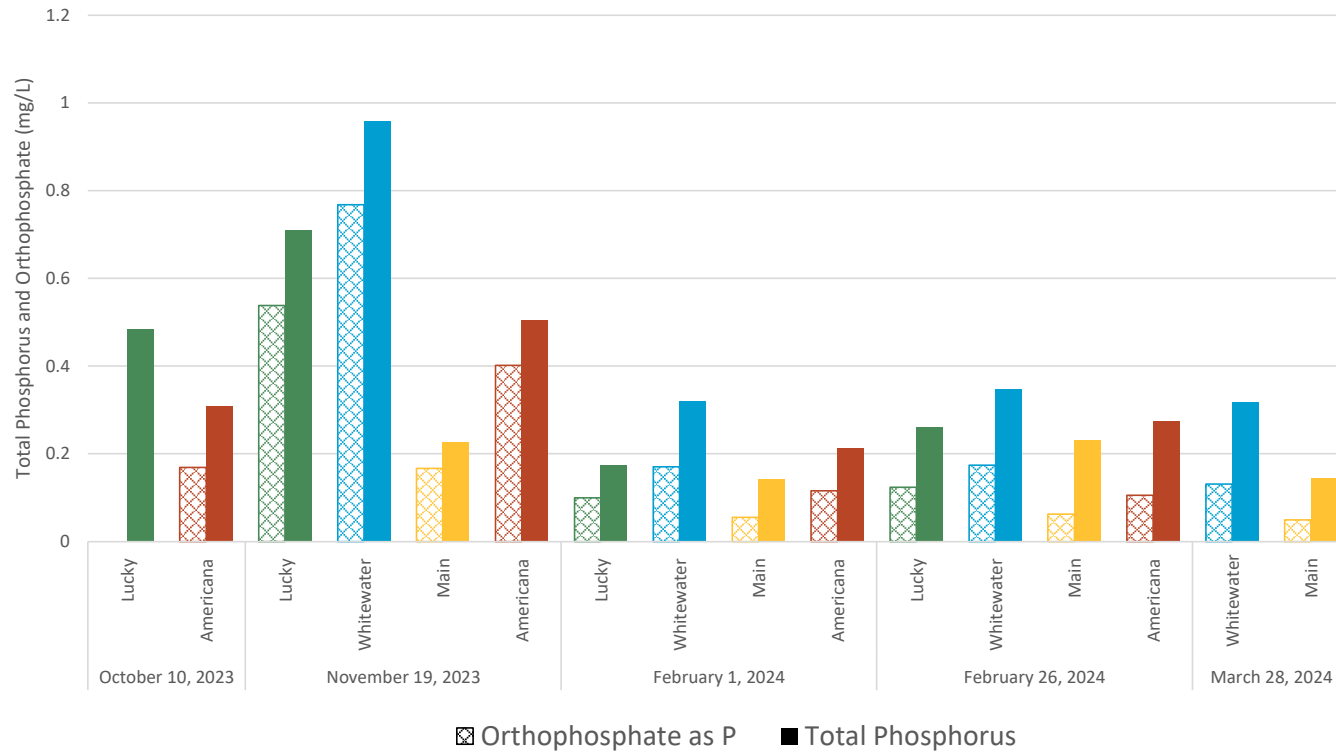


Figure 6. WY24 Pollutant Loadings

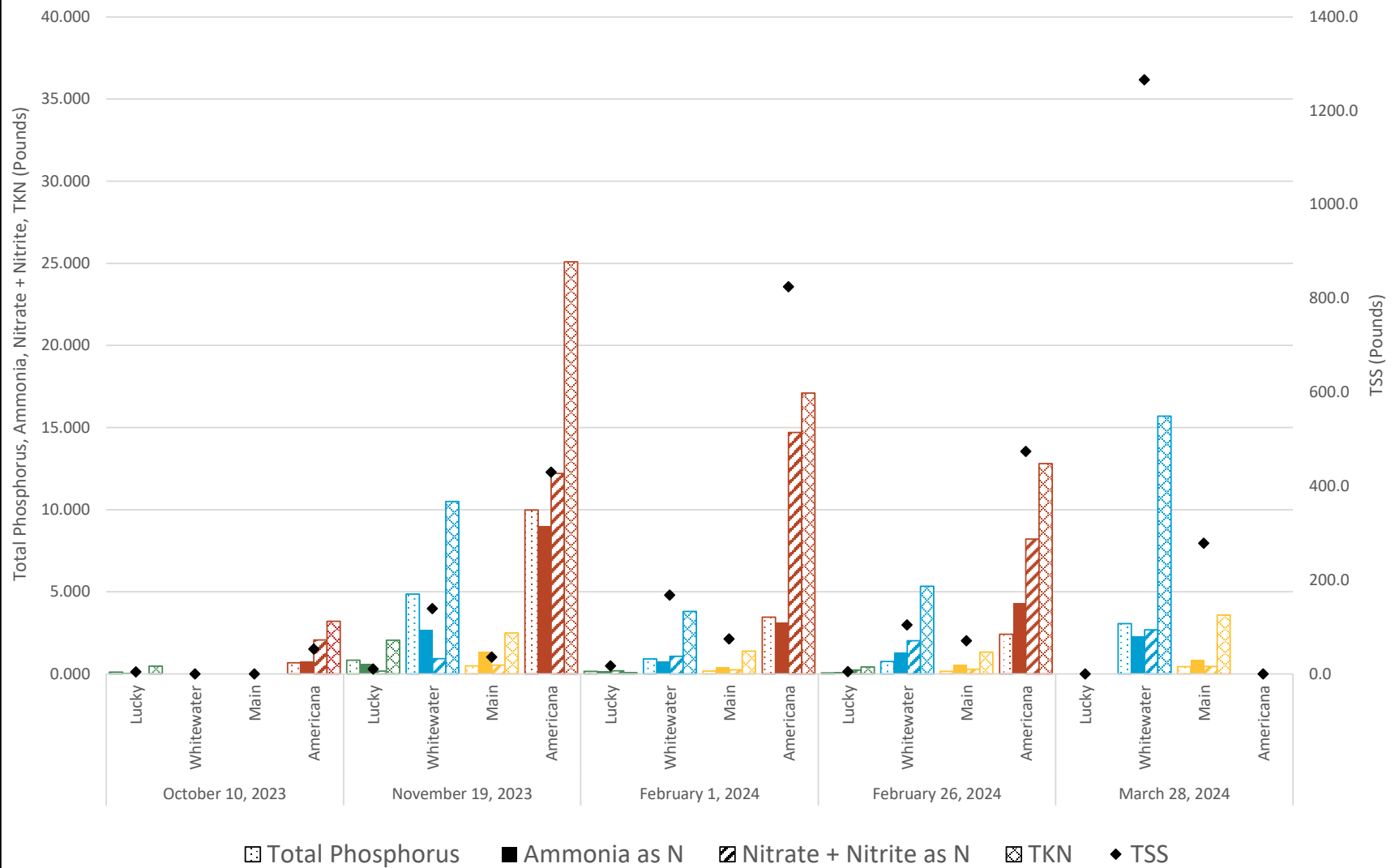
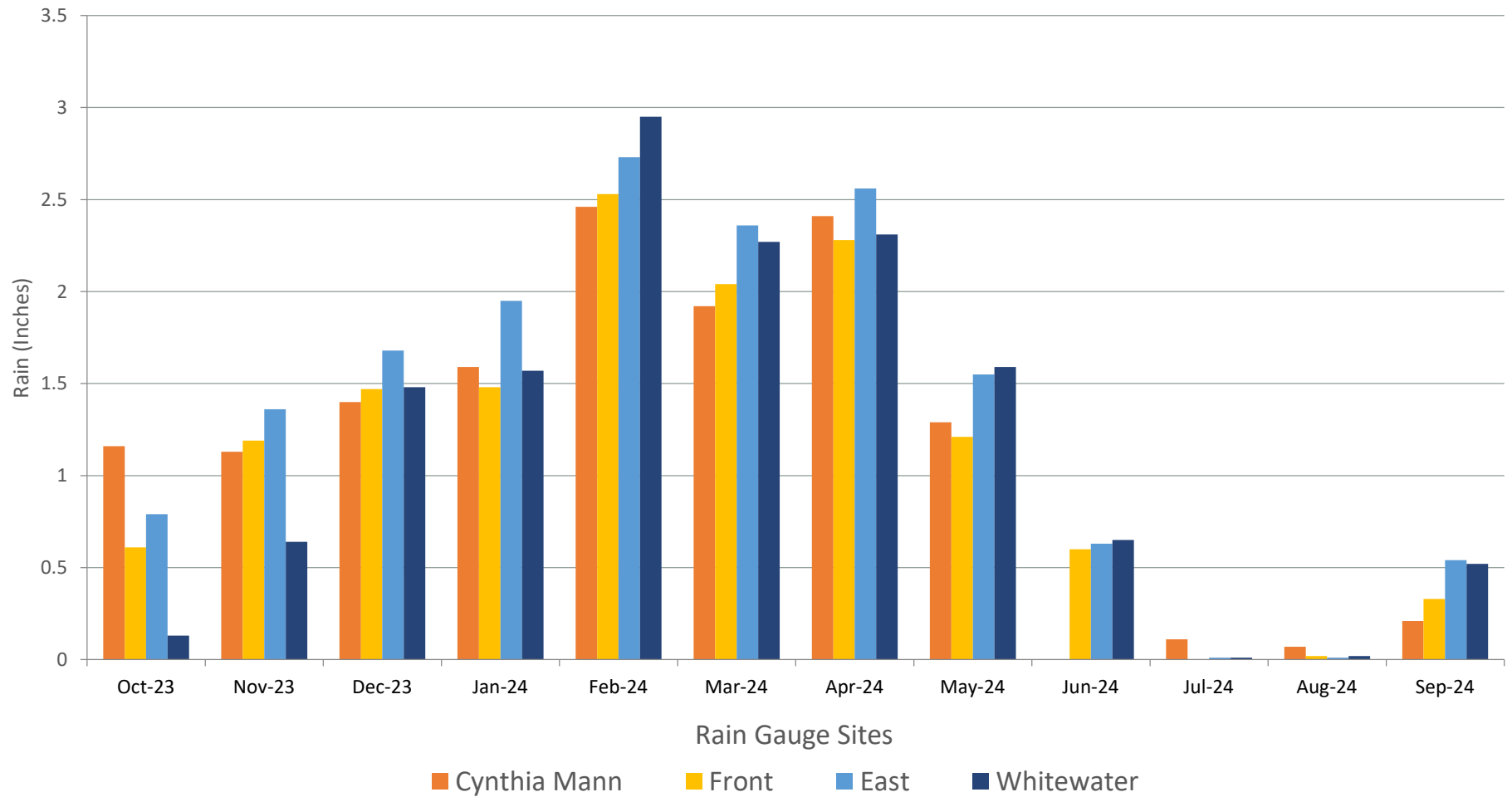


Figure 7. WY24 Monthly Precipitation



Appendix B: Tables

Table 1. Monitored Storms and Samples Collected

Table 2. Field Parameter Summary

Table 3. Analytical Results Summary

Table 4. Event Loading for Monitored Drainages in Pounds

Table 5. Event Loading in Pounds per Acre

Table 6. QC Sample Summary

Table 1. Monitored Storms and Samples Collected					
Event Date	Sampling Information	Lucky	Whitewater	Main	Americana
October 10, 2023	Grab samples collected and submitted?	YES	YES	NO	YES
	Composite samples collected and submitted?	YES	NO	NO	YES
	Trigger volume	2,895 gal	800 ft ³	-	2,960 ft ³
	Sampler enable condition (in)	Level > 3.02	Level > 2.60	-	Level > 5.1
	Percent of storm flow sampled	63%	-	-	71% ^a
	Composite sample duration (hrs.)	2	-	-	5
	Storm precipitation (in)	0.18	0.13	0.10	0.10/0.18
November 19, 2023	Grab samples collected and submitted?	YES	YES	YES	YES
	Composite samples collected and submitted?	YES	YES	YES	YES
	Trigger volume	2,895 gal	800 ft ³	3,411 gal	2,960 ft ³
	Sampler enable condition (in)	-	Level > 1.9	-	Level > 6.96
	Percent of storm flow sampled	94%	91%	80%	79%
	Composite sample duration (hrs.)	11	13	13.5	12.5
	Storm precipitation (in)	0.42	0.61	0.50	0.50/0.58
February 1, 2024	Grab samples collected and submitted?	YES	YES	YES	YES
	Composite samples collected and submitted?	YES	YES	YES	YES
	Trigger volume	7,899 gal	2,185 ft ³	9,313 gal	8,071 ft ³
	Sampler enable condition (in)	Level > 2.68	Level > 2.55 ^b	Level > 2.06	Level > 6.46
	Percent of storm flow sampled	90%	104% ^c	89%	83%
	Composite sample duration (hrs.)	14.5	40 ^b	13	13.5
	Storm precipitation (in)	0.31	0.33	0.31	0.31/0.37
February 26, 2024	Grab samples collected and submitted?	YES	YES	YES	YES
	Composite samples collected and submitted?	YES	YES	YES	YES
	Trigger volume	2,895 gal	800 ft ³	3,411 gal	2,960 ft ³
	Sampler enable condition (in)	Level > 2.72	Level > 3.05	Level > 1.87	Level > 7.59
	Percent of storm flow sampled	90%	87%	103% ^c	83%
	Composite sample duration (hrs.)	6.5	9.5	17 ^b	7
	Storm precipitation (in)	0.13	0.21	0.18	0.18/0.18
March 28, 2024	Grab samples collected and submitted?	NO	NO	YES	YES
	Composite samples collected and submitted?	NO	YES	YES	NO
	Trigger volume	-	800 ft ³	3,411 gal	-
	Sampler enable condition (in)	-	Level > 3.3	Level > 1.84	-
	Percent of storm flow sampled	-	82%	77%	-
	Composite sample duration (hrs.)	-	13	11	-
	Storm precipitation (in)	0.53	0.59	0.53	0.53/0.56

Notes:

-- = No data.

^a Flow data rejected due to area-velocity sensor errors. The EPA runoff calculation was used to estimate the total and sampled event runoff.

^b Programming error occurred at setup.

^c Non-stormwater samples were collected prior to the start of storm precipitation or runoff.

Table 2. Field Parameter Results					
Event Date	Monitoring Station	Field Parameters			
		Dissolved Oxygen	pH	Conductivity	Temperature
		mg/L	S.U.	µS/cm	C
October 10, 2023	Lucky	7.38	5.66	81.35	16.47
	Whitewater	7.65	6.28	95.09	17.17
	Main	-	-	-	-
	Americana	8.4	6.53	247.08	16.78
November 19, 2023	Lucky	5.09	7.27	506.44	15.70
	Whitewater	5.82	7.34	460.32	12.96
	Main	9.48	7.64	174.43	10.54
	Americana	- ^{3J}	- ^{3J}	- ^{3J}	14.16
February 1, 2024	Lucky	4.92	7.15	593.29	14.62
	Whitewater	8.42	7.60	287.02	11.10
	Main	10.11	8.03	353.6	6.30
	Americana	10.05	7.73	552.2	8.34
February 26, 2024	Lucky	9.89	8.27	125.9	4.75
	Whitewater	10.88	7.74	749.2	5.97
	Main	9.79	7.94	165.88	9.53
	Americana	10.54	7.53	470.55	8.74
March 28, 2024	Lucky	-	-	-	-
	Whitewater	-	-	-	-
	Main	10.02	7.82	116.08	10.91
	Americana	10.57	7.28	255.40	9.79

Notes:

-- = No data.

^{3J} Incomplete field parameter collection on the grab sample data form due to field error.

Table 3. Analytical Results Summary																							
Event Date	Monitoring Station	Sample ID	Analytical Parameters																				
			E. coli	BOD ₅	COD	Chloride	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			MPN/100 mL	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 10, 2023	Lucky	231010-03-WG/WC	2720.0	17.5 ^{1J}	83.0 ^{1J}	-	47.2 ^{1J}	19.6 ^{1J}	17.4 ^{1J}	126 ^{1J}	0.485 ^{1J}	-	0.336 ^{1J}	-	1.97 ^{1J}	2.6 ^{1J}	-	0.035 ^{1J}	-	-	0.65 ^{1J}	0.0118 ^{1J}	-
	Whitewater	231010-11-WG	1990.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Main	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Americana	231010-14-WG/WC	129.6	19.7 ^{2J}	77.0 ^{2J}	-	< 0.100 ^{2J}	33.6 ^{2J}	23.6 ^{2J}	236 ^{2J}	0.308 ^{2J}	0.169 ^{2J}	0.353 ^{2J}	0.930 ^{2J}	1.44 ^{2J}	5.5 ^{2J}	0.021 ^{2J}	0.072 ^{2J}	8.2 ^{2J}	0.095 ^{2J}	2.4 ^{2J}	< 0.0100 ^{2J}	22.0 ^{2J}
November 19, 2023	Lucky	231119-03-WG/WC	2.0	59.5	137	-	35.8	8.6	8.63	136	0.710	0.538	0.530	0.145	1.76	0.93	0.012	0.030	3.5	0.085	0.33	< 0.0100	32.7
	Whitewater	231119-11-WG/WC	99.0	61.9	167	-	45.0	19.7	27.3	180	0.958	0.768	0.527	0.182	2.07	1.7	< 0.0100	0.041	5 ²	0.21	2.2	< 0.0100	32.3
	Main	231119-12-WG/WC	30.9	19.9	61.0	-	19.3	11.7	16.2	61.0	0.226	0.167	0.610	0.246	1.14	0.66	0.015	0.045	2.7	0.12	1.7	< 0.0100	25.9
	Americana	231119-14-WG/WC	1340.0	36.5	94.0	-	57.8	15.0	21.7	153	0.504	0.402	0.454	0.614	1.27	2.1	0.022	0.061	4.0 ¹	0.11	1.9	< 0.0100	27.2
February 1, 2024	Lucky	240201-03-WG/WC	< 1.0 ^{4J}	7.27	39.0	6.25	16.0	60.5	18.8	52.8	0.174	0.100	0.173	0.204	0.894	0.85	< 0.0100	0.024	2 ²	0.056	0.82	< 0.0100	17.5
	Whitewater	240201-11-WG/WC	68.9 ^{4J}	9.34 ^{1R}	82.0 ^{1R}	14.5 ^{1R}	43.0 ^{1R}	106 ^{1R}	58.4 ^{1R}	139 ^{1R}	0.321 ^{1R}	0.171 ^{1R}	0.169 ^{1R}	0.375 ^{1R}	1.33 ^{1R}	2.4 ^{1R}	< 0.0100 ^{1R}	0.058 ^{1R}	3.9 ^{2, 1R}	0.18 ^{1R}	4.8 ^{1R}	0.0148 ^{1R}	25.7 ^{1R}
	Main	240201-12-WG/WC	238.2 ^{4J}	5.74	77.0	12.7	18.3	103	59.8	64.2	0.143	0.0557	0.351	0.209	1.12	1.4	0.012	0.066	3.6	0.084	4.1	0.0112	18.4
	Americana	240201-14-WG/WC	65.0 ^{4J}	6.98	55.0	64.1	93.3	89.6	50.7	224	0.213	0.116	0.193	0.905	1.05	3.4	0.016	0.063	3.4 ¹	0.090	4.2	< 0.0100	17.3
February 26, 2024	Lucky	240226-03-WG/WC	37.9	13.5	60.0	8.92	53.2	18.9	18.1	114	0.262	0.124	0.476	0.969	1.71	2.6	0.011	0.031	4.5	0.028	0.72	0.0150	13.5
	Whitewater	240226-11-WG/WC	38.3	12.6	84.0	44.4	77.8	52.3	47.3	182	0.347	0.174	0.596	0.921	2.43	2.6	0.014	0.062	4.4 ²	0.093	3.8	0.0151	24.5
	Main	240226-12-WG/WC	24.3	13.9 ^{5J}	119 ^{5J}	17.0 ^{5J}	29.8 ^{5J}	94.7 ^{5J}	104 ^{5J}	85.2 ^{5J}	0.231 ^{5J}	0.0631 ^{5J}	0.829 ^{5J}	0.424 ^{5J}	1.96 ^{5J}	1.5 ^{5J}	0.032 ^{5J}	0.13 ^{5J}	5.6 ^{5J}	0.12 ^{5J}	6.1 ^{5J}	0.0191 ^{5J}	51.7 ^{5J}
	Americana	240226-14-WG/WC	125.9	12.6	85.0	56.1	102	51.1	54.3	214	0.276	0.106	0.496	0.940	1.47	3.3	0.021	0.097	4.0 ¹	0.063	3.9	0.0148	24.3
March 28, 2024	Lucky	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Whitewater	240328-11-WC	-	8.20	84.0	14.9	31.9	26.2	131	76.0	0.318	0.131	0.236	0.277	1.63	2.0	< 0.0100	0.074	1.9 ²	0.097	5.8	0.0151	9.8
	Main	240328-12-WG/WC	21.6	5.03	104	5.19	12.6	24.6	91.7	44.2	0.145	0.0494	0.293	0.151	1.18	1.1	< 0.0100	0.071	2.3	0.068	5.9	0.0171	14.7
	Americana	240328-14-WG	365.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- = No data.

¹ Analytical parameter is qualified due to being less than five times the value detected in the rinsate blank. See Table 6 for rinsate blank results.

² Analytical parameter is qualified due to being less than five times the value detected in the equipment blank. See Table 6 for equipment blank results.

^{1J} Data qualified due to lack of representativeness (50%–75%).

^{2J} Data qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

^{4J} *E. coli* sample qualified due to exceeded hold time.

^{5J} Composite sample qualified due to non-stormwater sample volume comprising less than 10% of the total composite sample volume.

^{1R} Composite sample rejected due to non-stormwater sample volume comprising 10% or more of the total composite sample volume.

WG = Wet grab sample.

WC = Wet composite sample.

Table 4. Event Loading for Monitored Drainages in Pounds						
Event Date	Monitoring Station	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
October 10, 2023	Lucky	4.20 ^{1J}	0.118 ^{1J}	0.0810 ^{1J}	-	0.477 ^{1J}
	Whitewater	-	-	-	-	-
	Main	-	-	-	-	-
	Americana	52.6 ^{2J}	0.686 ^{2J}	0.786 ^{2J}	2.07 ^{2J}	3.21 ^{2J}
November 19, 2023	Lucky	10.1	0.832	0.621	0.170	2.06
	Whitewater	139	4.87	2.68	0.926	10.5
	Main	35.5	0.496	1.34	0.540	2.50
	Americana	430	9.98	8.99	12.2	25.1
February 1, 2024	Lucky	16.9	0.157	0.156	0.184	0.805
	Whitewater	168 ^{1R}	0.92 ^{1R}	0.750 ^{1R}	1.08 ^{1R}	3.81 ^{1R}
	Main	74.4	0.178	0.437	0.260	1.39
	Americana	825	3.46	3.140	14.7	17.1
February 26, 2024	Lucky	4.48	0.0648	0.118	0.240	0.423
	Whitewater	104	0.762	1.31	2.02	5.34
	Main	70.6 ^{5J}	0.157 ^{5J}	0.563 ^{5J}	0.288 ^{5J}	1.33 ^{5J}
	Americana	474	2.41	4.33	8.21	12.8
March 28, 2024	Lucky	-	-	-	-	-
	Whitewater	1266	3.07	2.28	2.68	15.7
	Main	278.2	0.440	0.889	0.458	3.58
	Americana	-	-	-	-	-

Notes:

-- = No data

^{1J} Data qualified due to lack of representativeness (50%–75%).

^{2J} Data qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

^{5J} Composite sample qualified due to non stormwater sample volume comprising less than 10% of the total composite sample volume.

^{1R} Composite sample rejected due to non stormwater sample volume comprising 10% or more of the total composite sample volume.

Table 5. Event Loading in Pounds/Acre						
Event Date	Monitoring Station	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
October 10, 2023	Lucky	0.0400 ^{1J}	0.00112 ^{1J}	0.000771 ^{1J}	-	0.00454 ^{1J}
	Whitewater	-	-	-	-	-
	Main	-	-	-	-	-
	Americana	0.0601 ^{2J}	0.000784 ^{2J}	0.000898 ^{2J}	0.00237 ^{2J}	0.00367 ^{2J}
November 19, 2023	Lucky	0.0962	0.00792	0.00591	0.00162	0.0196
	Whitewater	0.279	0.00978	0.00538	0.00186	0.0211
	Main	0.449	0.00628	0.0170	0.00684	0.0316
	Americana	0.491	0.0114	0.0103	0.0139	0.0287
February 1, 2024	Lucky	0.161	0.00150	0.00149	0.00175	0.00767
	Whitewater	0.337 ^{1R}	0.00185 ^{1R}	0.00151 ^{1R}	0.00217 ^{1R}	0.00765 ^{1R}
	Main	0.942	0.00225	0.00553	0.00329	0.0176
	Americana	0.943	0.00395	0.00359	0.0168	0.0195
February 26, 2024	Lucky	0.043	0.000617	0.00112	0.00229	0.00403
	Whitewater	0.209	0.00153	0.00263	0.00406	0.0107
	Main	0.894 ^{5J}	0.00199 ^{5J}	0.00713 ^{5J}	0.00365 ^{5J}	0.0168 ^{5J}
	Americana	0.542	0.00275	0.00495	0.00938	0.0146
March 28, 2024	Lucky	-	-	-	-	-
	Whitewater	2.54	0.00616	0.00458	0.00538	0.0315
	Main	3.52	0.00557	0.0113	0.00580	0.0453
	Americana	-	-	-	-	-

Notes:

-- = No data.

^{1J} Data qualified due to lack of representativeness (50%–75%).

^{2J} Data qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

^{5J} Composite sample qualified due to non stormwater sample volume comprising less than 10% of the total composite sample volume.

^{1R} Composite sample rejected due to non stormwater sample volume comprising 10% or more of the total composite sample volume.

Table 6. QC Sample Summary																							
Event Date	Parent Sample	Sample ID	QC Sample Type	Analytical Parameters																			
				E. coli	BOD ₅	COD	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate (Ortho-P)	Ammonia	Nitrate + Nitrite	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
				MPN/100 mL	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2, 2023	-	231002-12-003	Equipment blank	-	<2.00	7.00	<0.100	<0.3	<0.900	<20.0	<0.0120	<0.003	0.0560	<0.0250	<0.200	<0.0700	<0.0100	<0.100	0.18	<0.009	<0.0100	<0.0100	0.80
October 4, 2023	-	231004-11-003	Equipment blank	-	<2.00	<7.00	<0.100	<0.3	<0.900	<20.0	<0.0120	<0.003	<0.0350	<0.0250	<0.200	<0.0700	<0.0100	<0.0100	2.2	0.018	0.0250	<0.0100	1.4
October 5, 2023	-	231005-03-003	Equipment blank	-	<2.00	<7.00	<0.100	<0.3	<0.900	<20.0	<0.0120	<0.003	<0.0350	<0.0250	<0.200	<0.0700	<0.0100	<0.0100	0.41	<0.009	0.0210	<0.0100	1.4
	-	231005-14-003	Equipment blank	-	<2.00	<7.00	<0.100	<0.3	<0.900	<20.0	<0.0120	<0.003	<0.0350	<0.0250	<0.200	<0.0700	<0.0100	<0.0100	0.50	<0.009	0.0140	<0.0100	0.55
November 19, 2023	Americana grab	231119-14-001	Field blank	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Americana grab	231119-14-101	Field duplicate	866.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Calculated parent/duplicate RPD			4%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
February 1, 2024	Lucky grab	240201-03-001	Field blank	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lucky grab	240201-03-101	Field duplicate	2 ^{4J}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Calculated parent/duplicate RPD			100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Whitewater Composite	240201-11-103	Lab duplicate/composite split	—	8.9	83.0	42.4	113	53.8	140	0.312	0.172	0.170	0.378	1.35	2.4	0.011	0.052	3.7	0.19	4.9	0.0127	26.6
February 26, 2024	Main grab	240226-12-001	Field blank	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Main grab	240226-12-101	Field duplicate	26.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Calculated parent/duplicate RPD			2%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
March 28, 2024	Main grab	240328-12-001	Field blank	< 1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Main grab	240328-12-101	Field duplicate	17.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Calculated parent/duplicate RPD			5%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	240328-14-002	Field blank composite	-	< 2.00	< 7.00	< 0.100	< 0.3	< 0.900	< 20.0	< 0.0120	< 0.003	< 0.0450	< 0.0250	< 0.100	< 0.0700	< 0.0100	< 0.0100	< 0.150	<0.009	< 0.0100	< 0.0100	< 0.500
September 10, 2024	-	240910-11-004	Rinsate blank	-	< 2.00	< 7.00	< 0.100	< 0.3	< 0.900	< 25.0	< 0.0120	0.00795	< 0.0450	< 0.0250	< 0.100	< 0.0500	< 0.0100	< 0.0200	0.38	< 0.0100	0.017	< 0.0100	< 0.500
	-	240910-14-004	Rinsate blank	-	< 2.00	< 7.00	< 0.100	< 0.3	1.00	< 25.0	< 0.0120	< 0.003	< 0.0450	< 0.0250	< 0.100	< 0.0500	< 0.0100	< 0.0200	0.91	< 0.0100	0.026	< 0.0100	1.3
September 17, 2024	-	240917-12-004	Rinsate blank	-	< 2.00	< 7.00	< 0.100	< 0.3	< 0.900	< 25.0	< 0.0120	< 0.003	< 0.0450	< 0.0250	< 0.100	< 0.0500	< 0.0100	< 0.0200	0.20	< 0.0100	< 0.0100	< 0.0100	1.1
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%

- = No data.

^{4J} *E. coli* sample qualified due to exceeded hold time.

Cells highlighted in gray are flagged for discussion.

Appendix C: Storm Event Reports

Storm Event Report No. 1: October 10, 2023

Storm Event Report No. 2: November 19, 2023

Storm Event Report No. 3: February 1, 2024

Storm Event Report No. 4: February 26, 2024

Storm Event Report No. 5: March 28, 2024



Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 801.316.9859

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2024

Project No.: 159103

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for October 10, 2023

Date: February 14, 2024

To: Monica Lowe

Cc: Steven Turner

Kristen Chisholm

From: Zuly Lapa, Project Engineer

Prepared by: Zuly Lapa, EIT, Project Engineer

Reviewed by: Melissa Jannusch, PE, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 10, 2023. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The Environmental Protection Agency Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2024 (October 1, 2023, through September 30, 2024). The following storm event report summarizes stormwater sampling results from the October 10, 2023, storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2024 Phase I Stormwater Outfall Monitoring. When samples are qualified, additional samples will be attempted from subsequent storms to collect unqualified samples.

Table 2-1. WY 2024 Samples Collected					
Date	Lucky	Whitewater	Main	Americana	AS_6
October 10, 2023	G, C ^{1,2}	G	--	G, C ³	--
Unqualified Samples:	1G	1G	--	1G	--
Samples Remaining:	2G, 3C	2G, 3C	3G, 3C	2G, 3C	3G, 3C

Notes:

-- = no samples taken

C = composite sample

G = grab sample

¹ Composite samples qualified due to lack of representativeness (50% – 75%).

² Incomplete water quality analysis due to low composite sample volume.

³ Composite samples qualified due to lack of representativeness (50% – 75%) of the calculated flow volume.

Section 3: Storm Event Summary

The October 10, 2023, storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A summary of the forecast on which monitoring decisions were based is detailed below. The sampling event communication form that describes the forecast and summarizes the decision-making process from October 10, 2023, is included in Attachment A for reference.

Tuesday, October 10, 2023 – Wednesday, October 11, 2023

- On the morning of October 10, the National Weather Service issued a forecast for widespread rain in the Boise area, starting October 10 at 1800 and ending on October 11 at 0600. The chance of precipitation was 80%, with 0.10 to 0.20 inches of precipitation forecasted.
- Setup was accomplished early morning of October 10. An expected precipitation depth of 0.11 inches was used to set trigger volumes at monitoring stations. A runoff calculations worksheet showing how the trigger volumes were calculated is included in Attachment A.
- The runoff started approximately on October 10 at 1216 and ended on October 11 at 2300. There was a runoff break in between October 10 at 0936 and October 11 at 0738.
- Precipitation totals ranged between 0.10 and 0.18 inches at local rain gauges.

Flow measurements and precipitation data are listed in Table 1 along with a sampling summary. Hydrograph for the Lucky, Whitewater, and Americana site showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Americana and AS_6 monitoring stations were set up on October 10, 2023, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programmed into the Lucky, Whitewater, and Americana flowmeters. A site-specific velocity cutoff value was programmed into the AS_6 flowmeter. Setup and sampling information are included in Table 1. The field forms completed during setup/shutdown and sampling are included in Attachment C.

Grab Samples

Two, two-member team mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on October 10 at 1823. Grab samples for Lucky, Whitewater and Americana were submitted to the West Boise Water Quality Lab (WQL) at 2003 on October 10. Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment D.

Composite Samples

Composite samples were collected at the Lucky and Americana monitoring station and submitted to the West Boise WQL at 1242 on October 11. Whitewater collected two composite samples and was not submitted to the WQL. A partial water quality analysis was conducted on the Lucky composite samples due to low composite sample volume. The volume of the Americana composite sample was sufficient for analysis of all parameters. Analytical results are shown in Table 2 and pollutant loading estimates for the event are detailed in Table 3. Laboratory analytical reports are included in Attachment D.

Section 4: Quality Assurance/Quality Control

No quality control samples were collected during the October 10, 2023, storm event.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. An accepted composite sample represents at least 75 percent of the total discharge or at least 6 hours of the storm duration. The composite sample collected at Lucky was qualified because it represented 63% of the storm runoff and lasted approximately 2 hours. The composite sample collected at Americana was calculated using the EPA runoff calculation. After thorough flow and precipitation data review, it was determined that the area-velocity sensor showed inaccurate flow level readings and did not align with the precipitation data. The EPA runoff calculation estimates the total event runoff and sampled

runoff values based on impervious surface of the drainage basin (see Figure 4-1 for EPA's runoff calculation equation). Based on the estimated values, approximately 71% of the total storm runoff was sampled therefore the Americana composite samples were qualified. See Table 4-1 for total and sampled runoff calculations and Attachment B.

Runoff Calculation

$$R = P * P_j * R_v$$

Where:

R = Event Runoff (inches)

P = Event Rainfall (inches)

P_j = Fraction of annual rainfall events that produce runoff (0.9)

R_v = Runoff Coefficient

Figure 4-1: EPA Runoff Calculation

Table 4-1. Total and Sample Runoff Calculations

From Table 2-1 of the Stormwater Outfall Monitoring Plan:

Americana Subwatershed Area = 875 acres

Percent Impervious Groundcover = 39 %

Impervious Groundcover = 481 acres

Total Runoff from the Americana Watershed:

P = 0.14 inches

P_j = 0.9

R_v = 0.39

R = 0.049 inches

Sampled Runoff from the Americana Site:

P = 0.1 inches

P_j = 0.9

R_v = 0.39

R = 0.035 inches

Calculated Sampled Runoff Precipitation

Sampled/ Total Sampled Runoff x 100 = 71%

The acceptance and performance criteria for analytical and non-analytical criteria, except for Lucky and Americana composite samples, were met for this storm event.

Section 5: Notes and Recommendations

Americana

During set-up, a "Replace pump tubing" warning message was encountered when the sampler program was started. The ISCO Operating Manual was used to reset the program settings and reset the pump count. The message did not appear again when the sampler program was restarted.

Main

During set-up, the Main flow meter was providing positive flow readings, but no flow was observed in the storm drain pipe. The flow module was replaced, but this did not resolve the issue. Therefore, the Main site was not targeted at this event.

Data Tables



TAB-1

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	YES	NO	YES	NO
Composite samples collected and submitted?	YES	NO	NO	YES	NO
Trigger volume (gal or ft ³)	2,895 gal	800 ft ³	--	2960 ft ³	221 ft ³
Velocity cutoff (fps)	--	--	--	--	0.02
Sampler enable condition (in)	Level > 3.02 "	Level > 2.60 "	--	Level > 5.1 "	--
Runoff start time	1216 ¹	1407 ¹	--	1602 ²	--
Grab sample collection time	1829	1904	--	1823	--
Composite sample stop time	0906	--	--	1150	--
Runoff stop time	1110 ²	2300 ²	--	1630 ²	--
Volume of Discharge Sampled (ft ³)	2,439	--	--	111,486 ^{2,3}	--
Total runoff volume (ft ³)	3,882	5,838	--	156,081 ^{2,3}	--
Percent of storm flow sampled (%)	63%	--	--	71% ³	--
Composite sample duration (hrs)	2	--	--	5	--
Storm Precipitation (in)	0.18	0.13	0.10	0.10/0.18	0.10/0.18
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/ East
Sampler messages (counts): Success	8	2	--	11	--
Number of composite bottles filled	1	--	--	1	--
Composite sample volume (Approx.; ml)	5,000	--	--	5,750	--

Notes:

¹ Runoff started on 10/10/23.

² Runoff ended on 10/11/23.

³ Flow data rejected due to area-velocity sensor errors . The EPA runoff calculation was used to estimate the total and sampled event runoff.

Table 2. Field and Analytical Data Summary																											
Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				E. coli mpn/100 mL	Sample ID Composite	Analytical Parameters																		
			Dissolved Oxygen	pH	Conductivity	Temperature			BOD ₅	COD	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C			mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	10/10/2023	231010-03-WG	7.38	5.66	81.35	16.47	2720.0	231010-03-WC	17.5 ^{1J}	83 ^{1J}	47.2 ^{1J}	19.6 ^{1J}	17.4 ^{1J}	126 ^{1J}	0.485 ^{1J}	--	0.336 ^{1J}	--	1.97 ^{1J}	2.6 ^{1J}	--	0.035 ^{1J}	--	--	0.65 ^{1J}	0.0118 ^{1J}	--
Whitewater	10/10/2023	231010-11-WG	7.65	6.28	95.09	17.17	1990.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Main	10/10/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Americana	10/10/2023	231010-14-WG	8.4	6.53	247.08	16.78	129.6	231010-14-WC	19.7 ^{2J}	77 ^{2J}	<0.100 ^{2J}	33.6 ^{2J}	23.6 ^{2J}	236 ^{2J}	0.308 ^{2J}	0.169 ^{2J}	0.353 ^{2J}	0.930 ^{2J}	1.44 ^{2J}	5.5 ^{2J}	0.021 ^{2J}	0.072 ^{2J}	8.2 ^{2J}	0.095 ^{2J}	2.4 ^{2J}	<0.0100 ^{2J}	22.0 ^{2J}
AS_6	10/10/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
 -- = No data.
^{1J} Data qualified due to lack of representativeness (50% - 75%).
^{2J} Data qualified due to lack of representativeness (50% - 75%) of the calculated flow volume.

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
Lucky	10/10/2023	4.20 ^{1J}	0.118 ^{1J}	0.0810 ^{1J}	--	0.477 ^{1J}
Whitewater	10/10/2023	--	--	--	--	--
Main	10/10/2023	--	--	--	--	--
Americana	10/10/2023	52.6 ^{2J}	0.686 ^{2J}	0.786 ^{2J}	2.07 ^{2J}	3.21 ^{2J}
AS_6	10/10/2023	--	--	--	--	--

Notes:

-- = No data.

^{1J} Data qualified due to lack of representativeness (50% - 75%).

^{2J} Data qualified due to lack of representativeness (50% - 75%) of the calculated flow volume.

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 10/10/2023	Time: 4:10 PM	Initials: ML
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Yes

Past 72 hr Precip	0.02"
Date and time of expected event	10/10/2023 6 PM – 10/11/2023 6 AM
Expected amount of precipitation	0.10" – 0.20"
Percent chance of precipitation	80%
Percent chance of >0.10" over 12 hours	71%

NWS Update

<u>Targeted Station & Samples</u>					
Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☒ Grab	☐ Grab	☒ Grab	☒ Grab	☐ Grab
☒ Composite	☒ Composite	☐ Composite	☒ Composite	☒ Composite	☐ Composite

Type of Forecasted Precipitation

☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☒ Thunder Showers	☐ Snowmelt
☐ Other:		

Reasons for Not Targeting a Forecasted Storm and/or Stations
☐ Holiday
☐ Waiting on Antecedent Dry Period – Expires:
☒ Equipment Concerns: Problems with Main measuring flow when none present. Suspect AV sensor.
☐ Other:

Text Forecast
 NWS Forecast for: Garden City ID
 Issued by: National Weather Service Boise, ID
 Last Update: 2:53 pm MDT Oct 10, 2023

This Afternoon: Showers likely and possibly a thunderstorm. Mostly cloudy, with a high near 68. West southwest wind around 6 mph. Chance of precipitation is 60%.

Tonight: Showers and possibly a thunderstorm. Low around 47. West southwest wind around 6 mph becoming calm. Chance of precipitation is 90%. New rainfall amounts between a tenth and quarter of an inch, except higher amounts possible in thunderstorms.

Wednesday: Showers and possibly a thunderstorm before 1pm, then a chance of showers. High near 58. West northwest wind 5 to 14 mph, with gusts as high as 23 mph. Chance of precipitation is 90%.

Wednesday Night: A 30 percent chance of showers before 1am. Patchy fog after 4am. Otherwise, cloudy, then gradually becoming partly cloudy, with a low around 42. Northwest wind 5 to 14 mph, with gusts as high as 23 mph.

Thursday: Patchy fog before 1pm. Otherwise, sunny, with a high near 63. Northwest wind 5 to 10 mph.

Thursday Night: Mostly clear, with a low around 42.

Friday: Sunny, with a high near 68.

Friday Night: Partly cloudy, with a low around 48.

Saturday: Mostly cloudy, with a high near 67.
Saturday Night: A 20 percent chance of showers after 1am. Mostly cloudy, with a low around 49.
Sunday: A 20 percent chance of showers. Partly sunny, with a high near 70.
Sunday Night: Mostly cloudy, with a low around 50.
Monday: Partly sunny, with a high near 74.
Monday Night: A 30 percent chance of showers. Mostly cloudy, with a low around 52.
Tuesday: A chance of showers. Mostly cloudy, with a high near 66.

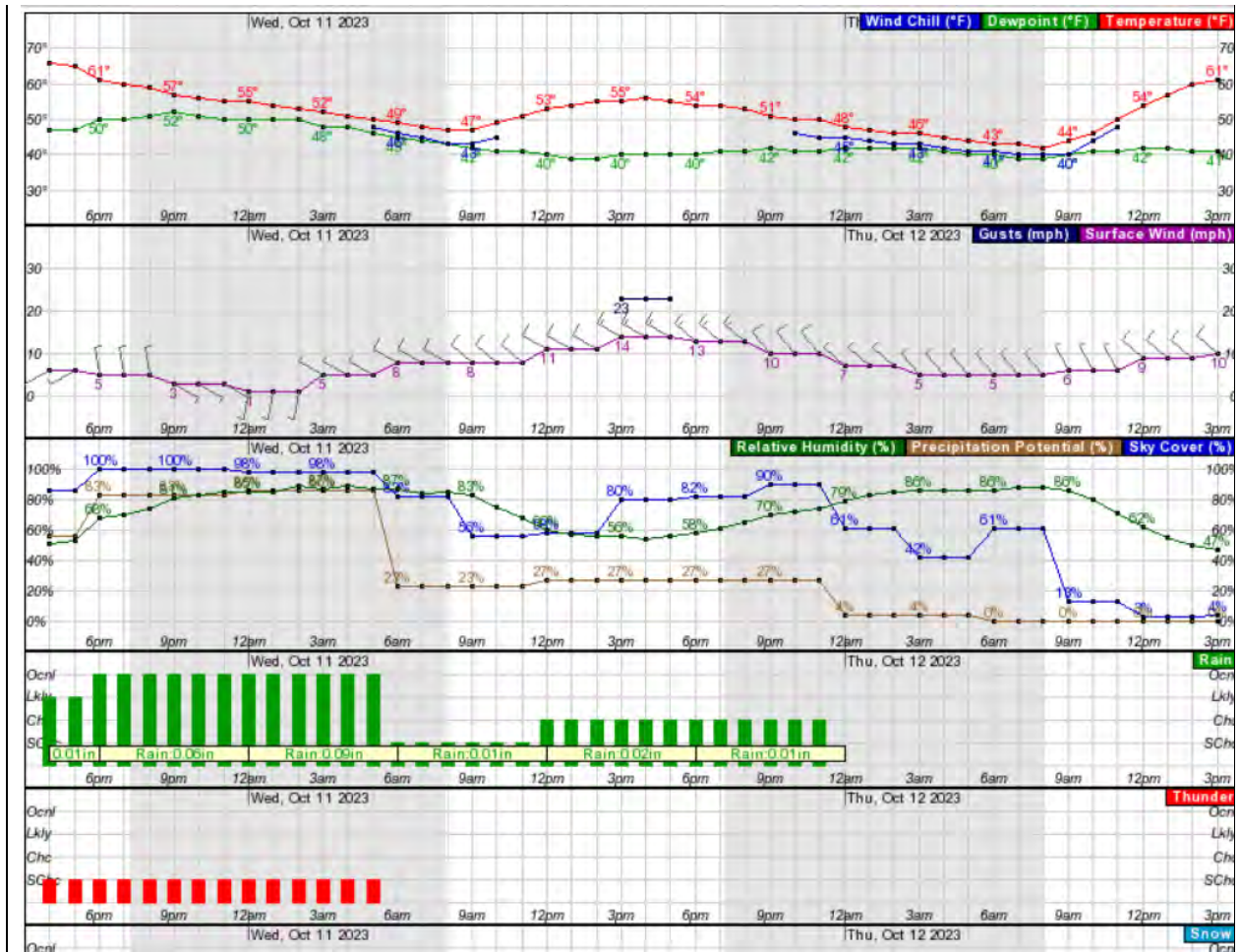
Forecast Discussion

Area Forecast Discussion
National Weather Service Boise ID
233 PM MDT Tue Oct 10 2023

.SHORT TERM...Tonight through Thursday night...Showers have steadily increased through the day in eastern Oregon, and as of 2 PM MDT showers were also getting into the Treasure Valley and Weiser River Valley. No [lightning](#) has been observed yet, but the incoming upper [trough](#) is expected to provide enough [instability](#) later this afternoon and evening for [isolated](#) thunderstorms within about 50 miles either side of the OR/ID border. Showers will become widespread tonight in western Idaho, then decrease Wednesday morning except along the ID/NV border and the Boise Mountains and eastern Valley County. Total precipitation tonight through Wednesday should be .10 to .20 inch in the valleys and .25 to .50 inch in the mountains, including 1-2 inches of snow above 6500 feet [MSL](#). Later Wednesday the main upper low off the northwest coast will move rapidly inland and bring another chance of showers to eastern Oregon, then into western Idaho early Wednesday evening. Late Wednesday night the low will be in eastern Wyoming and clouds will decrease in our [CWA](#). Clearing skies will allow [radiational cooling](#) resulting in patchy [fog](#) in the valleys Thursday morning. Thursday afternoon and night look [mostly clear](#). Winds will be light to moderate westerly tonight and Wednesday morning, then increase almost to advisory speeds Wednesday afternoon in south-central Idaho. Winds will die down rapidly Wednesday night.

.LONG TERM...Friday through Tuesday...A warming and drying trend is forecast Friday through Monday, possibly Tuesday, as another upper [ridge](#) builds inland from the Pacific. High temps will reach at least the mid 70s in the valleys by Monday, with a 10 percent chance of 80 degrees again. Low temps will moderate more slowly. Unfortunately, latest models bring a lot of [high clouds](#) in from the Pacific on Saturday which may spoil the view of the annular solar eclipse Saturday morning.

Hourly Forecast



Storm Event QA/QC Checklist – Phase I

STORM DATE <u>231010</u>									
A. Event and Data Completeness									
1. Field data sheets filled out completely and clearly	Yes	No	N/A	Notes					
2. Field parameters reviewed, and any problems/issues addressed	X			WW field parameters difficult to read: verified					
3. All samples collected as specified	X			DO is 7.65 mg/L + sp cond. is 95.09 w/ Chad Shuwend					
4. All samples delivered to lab promptly (review chain of custody rpts)	X								
5. Inconsistencies/clarifications discussed with sampling team member	X								
6. All analytical reports from lab received	X								
B. Validation and Verification Methods									
1. Outliers and unexpected values discussed with lab			X						
2. Appropriate analytical methods used	X								
3. All lab QA samples were within method acceptance criteria	X								
4. All samples reviewed and data qualifiers assigned if needed	X								
5. Data quality objective achieved	X								
C. Specific Storm and Sample QA/QC Criteria									
	Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)	0.03	0.00	—	0.01	0.01	< 0.11" in 72 hrs	X		
2. Precipitation (inches)	0.18	0.13	—	0.10/0.18	0.10/0.18	> 0.10"	X		
3. Sampled amount (% of total run-off)	63%	—	—	71%	—	>= 75% or >= 6 hrs: no qualifier >= 50% and <75%: qualify		X	
4. Composite sample duration (hours)	2.0	—	—	5.0	—	< 50%: reject			
4. Ecoli sample holding time (hours)	2.0	1.5	2.0	2	—	<= 8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X		
5. Filtering of samples for dissolved parameter analysis (hours)	—	—	—	1.5	—	<= 24 hrs: no qualifier > 24 hrs.: reject	X		
D. Notes									
<u>Lucky</u> – No diss. parameters due to low volume and qualified due to lack of representativeness <u>WW</u> – Composite discarded due to low sample volume (2 subsamples) <u>Main</u> – Not setup for storm due to flow ~~sensor~~ error. Flow readings when no flow present <u>Americana</u> – Composites qualified for ~~representativeness~~ lack of representativeness and *Americana flow rejected. Runoff coefficients used to calculate total event runoff + sampled runoff values. <u>AS-6</u> – No grabs or composites collected due to low flow.									

Reviewed by Steven Turner

Date 2/12/24

Approved by Monica Lowe

Date 2/12/24

Storm Runoff Estimates and Trigger Volumes

Step 1. Enter runoff coefficients in yellow cells.

Step 2. Enter expected precipitation depth (in) in blue cell.

Step 3. Read trigger volumes (**bold**) in green cells.

Expected Precipitation Depth = 0.11

Aliquots per Sample = 17

Site	Area (ac)	Using RC calculated from flow data		
		RC	Expected Vol (ft ³)	Trigger Vol (ft ³)
Lucky	105	0.157	6582.5	387
Whitewater	498	0.069	13621.3	801
Main	79	0.246	7760.0	456
Main Alt	60	0.200	4791.6	282
Americana	875	0.144	50311.8	2960
AS_6	204	0.046	3747.0	220
State	34	0.160	2172.2	128

Notes:

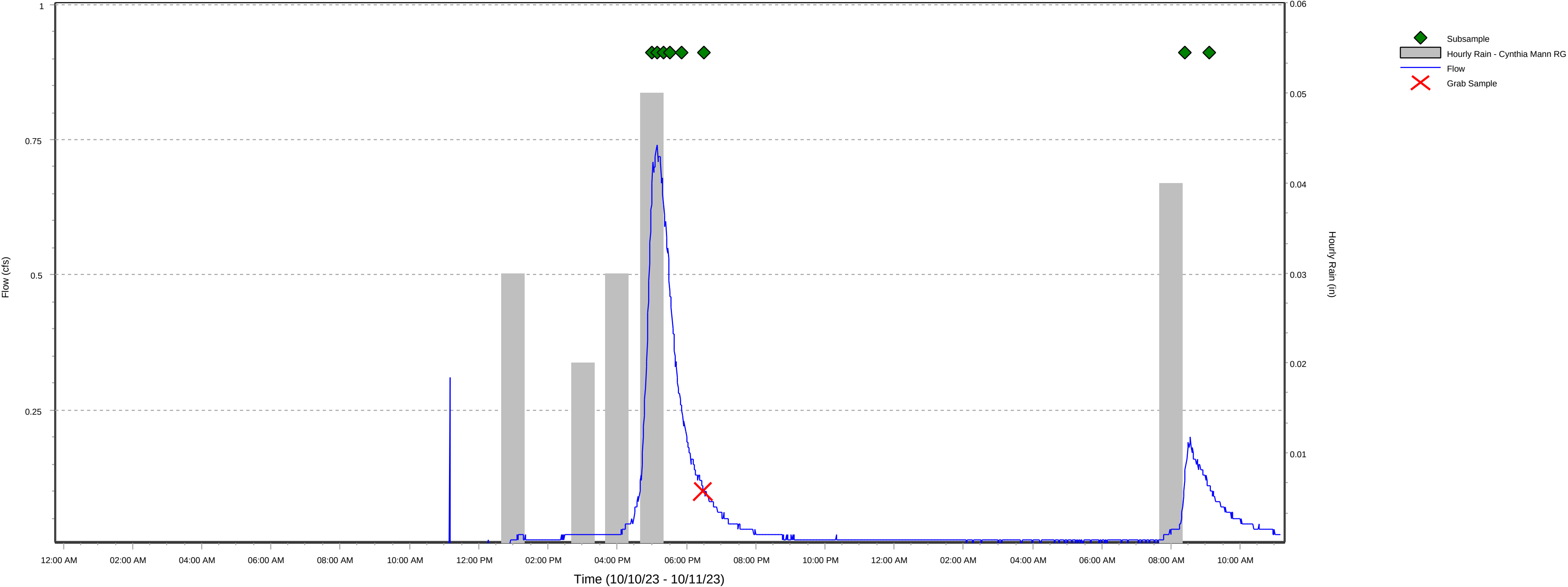
Calculated RC = Average ($\text{precip (ft)} / [\text{volume (ft}^3\text{)} \times \text{area (ft}^2\text{)}]$)

Where precip (ft) is the measured amount from local rain guage, and $\text{volume (ft}^3\text{)}$ is the measured discharge, and $\text{area (ft}^2\text{)}$ is the watershed area

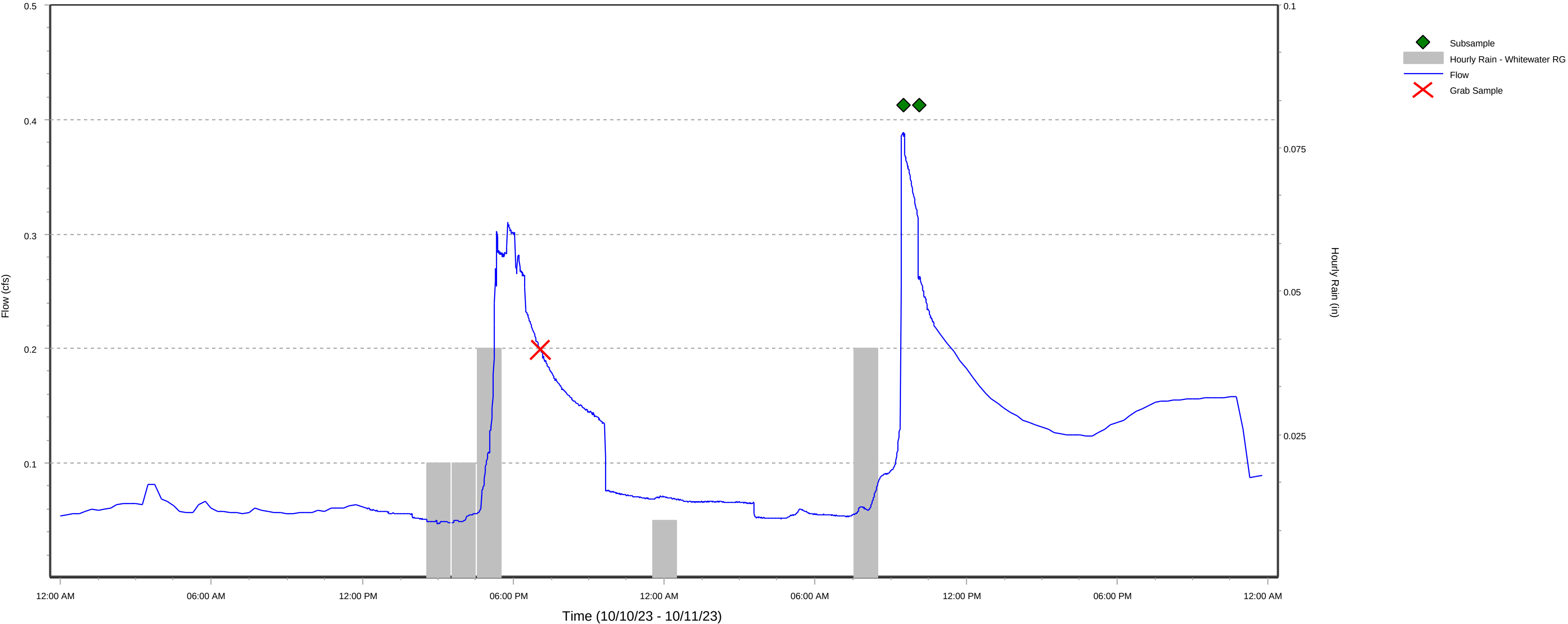
Expected volume (ft³) = RC x expected precip (ft) x area (ft²)

Attachment B: Storm Event Hydrographs

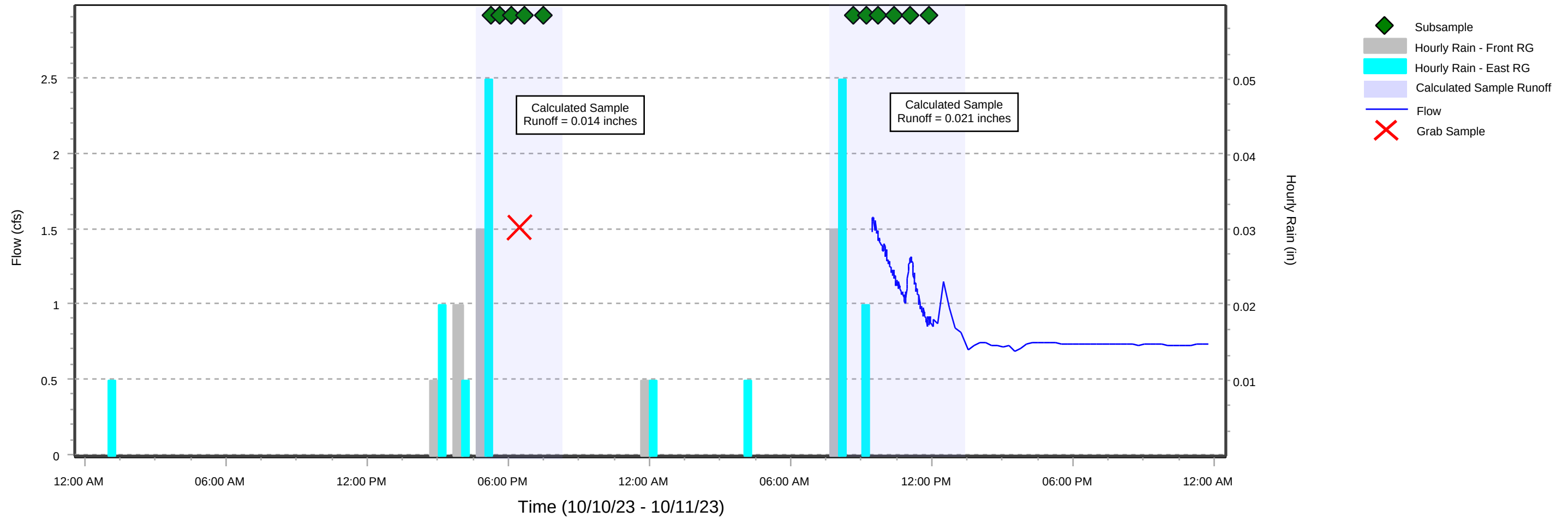
Lucky Hydrograph



Whitewater Hydrograph



Americana Hydrograph



Attachment C: Field Forms

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: Lucky

SET UP

Personnel: KC, ST

Date/Time: 10/10/23 1042

On-Site: 10/10/23 1042

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
10:51	2.02	0.0	0.0	13.41 V
Enable Condition or Velocity Cutoff:			3.02	
Deadband:			1.0	
Trigger Volume:			2895 gal	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: KC, ST

Date/Time: 10/10/23 0902 KC

On-Site: 10/10/23 0902 KC

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1108	2.15	10.72	0.15		
0917	2.34	0.11	0.37		12.7
Downloaded to: <u>Uploaded to KC</u>					

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Lucy
 Personnel: KC, ST

Bottle 1 of 1
 Date/Time On-Site: 10/11/23 0830

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>231010 - #1 #03</u> -WC
Approx Sample Volume (mL): <u>5000 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Clear</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>brown</u>
QA/QC Sample ID: <u>-103</u> (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	10/10/23 1700	Successful ↓	13		
2	10/10/23 1710		14		
3	10/10/23 1720		15		
4	10/10/23 1732		16		
5	10/10/23 1751		17		
6	10/10/23 1831		18		
7	10/11/23 0823		19		
8	10/11/23 0906		20		
9			21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle, add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Lucy

Personnel: 2LCS

Date/Time On-Site: 10/10/23 1815pm

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1819	2.23	7.35	0.09	12.9	10/10/23 17:00	

Grab Information				
	Sample ID	Date	Time	Labeled?
Site E.Coli	231010-03 -WG	10/10/23	1829	☒
Field Duplicate E.Coli	231010-03 -101	10/10/23		☐
Field Blank E.Coli	231010-03 -001	10/10/23		☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP09	1830	16.47	7.38	5.66	81.35

Sampler Current Status	
First Subsample Date/Time	10/10/23 1700
Last Subsample Date/Time	10/10/23 1832
# of Subsamples taken	6

Comments:

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

STATION: Whitewater

SET UP

Personnel: KC, ST

Date/Time
On-Site: 10/10/2023 1146

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1146	1.47	0.04	0.41	—
Enable Condition: <u>2.6</u>				
Hysteresis: <u>10"</u>				
Flow Pulse Interval: <u>800 cf</u>				

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time 10/10/23 1150
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: KC, ST

Date/Time
On-Site: 10/10/23 0902
1040

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
0917	2.34	0.11	0.37	—
Downloaded to: <u>Rugged 6 / USB</u>				
1040	2.06	0.22	0.90	—

On-Site

- ☐ Replace flowmeter battery ball
- ☒ Remove battery from sampler Always connect to power. Not on battery.

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 0905
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Whitewater
 Personnel: K.C. ST

Bottle 1 of
 Date/Time On-Site: 10/11/23 1040

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	10/11/23 0910	Successful	13		
2	↓ 0958		14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

Sample discarded not

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning - Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: whitewater

Personnel: ZL, CS Date/Time On-Site: 10/10/23 1851

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1851	2.09	~~0.81~~ 0.90	0.81	-	10/10/23 1600	0.08 in

Grab Information				
	Sample ID	Date	Time	Labeled?
Site E. Coli	231010-11 -WG	10/10/23	1904	☒
Field Duplicate E. Coli	-101			☐
Field Blank E. Coli	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
M809	1904	17.17	7.55	6.28	195.09

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

@1900 no composite samples taken yet. only grabs.

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: Main

SET UP

Personnel: KC, ST

Date/Time
On-Site: 10/10/23 1228

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1230				13.5
Enable Condition or Velocity Cutoff:				
Deadband:				
Trigger Volume:				

- ☒ Install batteries on flowmeter and sampler
- ☐ Perform decon. cycle
- ☐ Install 15L sample bottle, with ice
- ☐ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☐ Verify all cable and tubing connections
- ☐ Check date and time on flowmeter and sampler
- ☐ Set flowmeter program and sampler program parameters
- ☐ Set logging interval to 1 minute
- ☐ Start flowmeter program and sampler program
- ☐ Verify running

Comments:

flow meter giving readings even though no flow in pipe. Tried swapping flow meter out for a new one. Same readings given. Not targetting Main for this event. Sensor appears to be reading incorrectly.

SHUT DOWN

Personnel: _____

Date/Time
On-Site: _____

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
Downloaded to:					

If flow monitoring is complete:

- ☐ Halt program on flowmeter
- ☐ Download flowmeter data
- ☐ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: _____
 Personnel: _____

Bottle _____ of _____

Date/Time On-Site: _____

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle, add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

TATION: Americana

SET UP

Personnel: KC ST

Date/Time

On-Site: 10/10/23 1247

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
<u>0916</u>	<u>3.81</u>	<u>0.72</u>	<u>1.544</u>	<u>11.59</u>
Enable Condition:		<u>5.1"</u>		
Hysteresis:		<u>1.0"</u>		
Flow Pulse Interval:		<u>29100 cf</u>		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time 10/10/23 0920
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

"Replace pump tubing" warning when program started. Followed manual directions to select pump alarm & reset pump count. Error message went away. tube

SHUT DOWN

Personnel: KC ST

Date/Time

On-Site: 10/11/23 1151

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
<u>1151</u>	<u>4.34</u>	<u>0.9</u>	<u>1.593</u>	<u>12.13</u>
Downloaded to:		<u>USB</u>		

On-Site

- ☐ Replace flowmeter battery
- ☐ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☐ Direct or Remote; Date/time 10/11/23 1205
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

STATION: Americana
 Personnel: KC, ST

Composite Sample Collection

Bottle 1 of 1
 Date/Time On-Site: 10/10/23 1815

☐ Halt sampler program		
☐ Put lid on sample bottle; label sample bottle		
Sample ID:	<u>231011-14</u>	-WC
Approx Sample Volume (mL):	<u>5750 mL</u>	
Clarity (ex. Clear, Cloudy, Silty):	<u>Silty</u>	
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>	
QA/QC Sample ID:	-103	(Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>10/10/23 17:13</u>	<u>Success</u> ↓	13		
2	<u>1736</u>		14		
3	<u>1804</u>		15		
4	<u>1839</u>		16		
5	<u>1926</u>		17		
6	<u>10/11 839</u>		18		
7	<u>908</u>		19		
8	<u>942</u>		20		
9	<u>1020</u>		21		
10	<u>1103</u>		22		
11	<u>1150</u>		23		
12			24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Americana

Personnel: KC ST Date/Time On-Site: 10/10/23 18:15

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1817	55	1.41	1.768	12.04		

Grab Information					
	Sample ID		Date	Time	Labeled?
Site E.Coli	23/010-14	-WG	10/10/23	1823	☒
Field Duplicate E.Coli		-101			☐
Field Blank E.Coli		-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP11	1826	16.78	8.40	6.53	247.08

Sampler Current Status	
First Subsample Date/Time	10/10/23 1713
Last Subsample Date/Time	10/10/23 1804
# of Subsamples taken	3

Comments:

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: AS-6

SET UP

Personnel: KC, ST

Date/Time
On-Site: 10/10/23 1352

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1352	0.0	0.0	0.0	12.5
Enable Condition or Velocity Cutoff:			0.02	
Deadband:				
Trigger Volume:			221 CF	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

Using ⁴⁹⁰~~480~~ mL for sample volume

SHUT DOWN

Personnel: KC, ST

Date/Time
On-Site: 10/10/23 0956

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1008	0.922	0.01	0.37	198	12.3
Downloaded to:			Rugged 6		

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☐ Download flowmeter data
- ☐ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments: No composite or grab samples submitted due to low flow levels.

Composite Sample Collection

STATION: _____

Bottle _____ of _____

Personnel: _____

Date/Time On-Site: _____

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

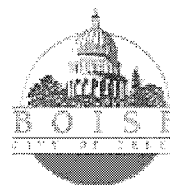
Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle, add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Attachment D: Storm Event Analytical Reports

Report Date: 10/25/2023 11:20



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00321-01	ACST1B	231010-03-WG	Water		10/10/2023	10/10/2023
AC00321-02	ACST1B	231010-11-WG	Water		10/10/2023	10/10/2023
AC00321-03	ACST1B	231010-14-WG	Water		10/10/2023	10/10/2023

Report Date: 10/25/2023 11:20



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 10/10/2023 18:29
Lab Number: AC00321-01
Sample Type: Grab

Location Description: 231010-03-WG
Sample Collector: C.S
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst		
				MDL *	MDL				Initials	Qualifier	
Microbiology											
E. Coli	B234049	2720.0 MPN/100 mL		100.0	1.0	IDEXX - Colilert	10/10/23 20:25	10/11/23 20:25	LRF		D
Wet Chemistry											
Chlorine Screen	B234050	Absent				SM 4500-CL G-2000 mod	10/10/23	10/10/23 20:11	JAL		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 10/25/2023 11:20



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 10/10/2023 19:04
Lab Number: AC00321-02
Sample Type: Grab

Location Description: 231010-11-WG
Sample Collector: C.S
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst		
				MDL *	MDL				Initials	Qualifier	
Microbiology											
E. Coli	B234049	1990.0 MPN/100 mL		100.0	1.0	IDEXX - Colilert	10/10/23 20:25	10/11/23 20:25	LRF		D
Wet Chemistry											
Chlorine Screen	B234050	Absent				SM 4500-CL G-2000 mod	10/10/23	10/10/23 20:11	JAL		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 10/25/2023 11:20



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

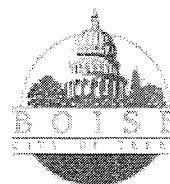
Location: ACST1B
Date/Time Collected: 10/10/2023 18:23
Lab Number: AC00321-03
Sample Type: Grab

Location Description: 231010-14-WG
Sample Collector: K.C
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL					Initials	Qualifier
Microbiology											
E. Coli	B234049	129.6 MPN/100 mL		1.0	1.0	IDEXX - Colilert		10/10/23 20:25	10/11/23 20:25	LRF	
Wet Chemistry											
Chlorine Screen	B234050	Absent				SM 4500-CL G-2000 mod		10/10/23	10/10/23 20:11	JAL	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 10/25/2023 11:20



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B234049									
Blank (B234049-BLK1)									
E. Coli	Absent						10/11/2023	LRF	
LCS (B234049-BS1)									
E. Coli				Present			10/11/2023	LRF	
Duplicate (B234049-DUP2) Source ID: AC00321-01RE1									
E. Coli					Pass	128	10/11/2023	LRF	



Notes and Definitions

Item	Definition
D	Data reported from a dilution

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
 3775 Adams Street
 Garden City, Idaho 83714-6418
 Tel. (208) 387-6269
 Fax (208) 387-6391
 Purchase Order:
 Project:
 Sampler(s):

63065628

Stormwater-PI

Kristen Chisholm

Steven Turner

Chad Schwend

Elizabeth Lapa

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix		Type		Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
							Water		Grab																		
AC00321																											
-01	10/10/23		1829		231010-03-WG	CS	X		X													X					1
-02	↓		1904		231010-11-WG	CS	X		X													X					1
-03	↓		1823		231010-14-WG	KC	X		X													X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristen Chisholm	10/10/23 2003	Jat 10.10.23	2003

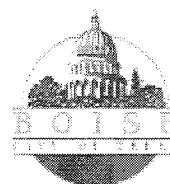
Report Date: 12/04/2023 12:04



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00322-01	ACST1C	231010-03-WC	Water		10/11/2023	10/11/2023
Comments:						
Low volume. No dissolved parameters were collected.						
AC00322-02	ACST1C	231010-14-WC	Water		10/11/2023	10/11/2023



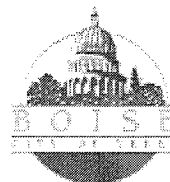
Analysis Report

Location: ACST1C
Date/Time Collected: 10/10/2023 17:00 - 10/11/2023 09:06
Lab Number: AC00322-01
Sample Type: Composite

Location Description: 231010-03-WC
Sample Collector: K.C
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B234335	0.336	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	10/28/23	10/28/23 12:02	MEC	
BOD5	B234067	17.5	mg/L	2.00	2.00	SM 5210 B-2016	10/12/23	10/17/23 9:13	RKT	
COD	B234066	83.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	10/12/23	10/12/23 9:31	JAL	
TKN	B234085	1.97	mg/L	0.200	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	10/13/23	10/13/23 18:35	EDM	
Total Dissolved Solids	B234048	126	mg/L	20.0	20.0	SM 2540 C-2015	10/12/23	10/13/23 11:02	RKT	
Total Suspended Solids	B234076	17.4	mg/L	0.900	0.900	SM 2540 D-2015	10/12/23	10/12/23 9:41	RKT	
Turbidity	B234051	19.6	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	10/11/23	10/11/23 13:52	KMR	
Total Metals										
Mercury	B234059	0.0118	ug/L	0.0100	0.0100	EPA 245.1	10/12/23	10/13/23 8:03	SAS	
Arsenic	B234105	2.6	ug/L	0.070	0.070	EPA 200.8	10/18/23	10/19/23 15:37	DMW	
Cadmium	B234105	0.035	ug/L	0.010	0.010	EPA 200.8	10/18/23	10/19/23 15:37	DMW	
Calcium	B234177	15.8	mg/L	0.0400	0.0400	EPA 200.7	10/19/23	10/20/23 10:04	AMO	
Lead	B234105	0.65	ug/L	0.010	0.010	EPA 200.8	10/18/23	10/19/23 15:37	DMW	
Magnesium	B234177	1850	ug/L	80.0	80.0	EPA 200.7	10/19/23	10/20/23 10:04	AMO	
Phosphorus as P	B234177	0.485	mg/L	0.0120	0.0120	EPA 200.7	10/19/23	10/20/23 10:04	AMO	
Hardness	B234177	47.2	mg/L	0.100	0.100	SM 2340 B-2011	10/19/23	10/20/23 10:04	AMO	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.



Analysis Report

Location: ACST1C
Date/Time Collected: 10/10/2023 17:13 - 10/11/2023 11:50
Lab Number: AC00322-02
Sample Type: Composite

Location Description: 231010-14-WC
Sample Collector: K.C
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier

Wet Chemistry

Ammonia, as N	B234335	0.353	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	10/28/23	10/28/23 11:59	MEC	
BOD5	B234067	19.7	mg/L	2.00	2.00	SM 5210 B-2016	10/12/23	10/17/23 9:06	RKT	
COD	B234066	77.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	10/12/23	10/12/23 9:31	JAL	
Nitrate-Nitrite, as N	B234143	0.930	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	10/17/23	10/17/23 15:14	BAK	
TKN	B234085	1.44	mg/L	0.200	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	10/13/23	10/13/23 18:36	EDM	
Total Dissolved Solids	B234048	236	mg/L	20.0	20.0	SM 2540 C-2015	10/12/23	10/13/23 11:03	RKT	
Total Suspended Solids	B234076	23.6	mg/L	0.900	0.900	SM 2540 D-2015	10/12/23	10/12/23 9:42	RKT	
Turbidity	B234051	33.6	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	10/11/23	10/11/23 14:00	KMR	

Dissolved Wet Chemistry

Orthophosphate, as P	B234046	0.169	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	10/11/23	10/11/23 14:01	JAL	

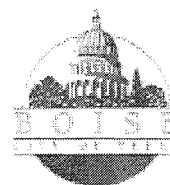
Total Metals

Mercury	B234059	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	10/12/23	10/13/23 7:14	SAS	U
Arsenic	B234105	5.5	ug/L	0.070	0.070	EPA 200.8	10/18/23	10/19/23 15:46	DMW	
Cadmium	B234105	0.072	ug/L	0.010	0.010	EPA 200.8	10/18/23	10/19/23 15:46	DMW	
Calcium	B234177	<0.0400	mg/L	0.0400	0.0400	EPA 200.7	10/19/23	10/20/23 10:09	AMO	U
Lead	B234105	2.4	ug/L	0.010	0.010	EPA 200.8	10/18/23	10/19/23 15:46	DMW	
Magnesium	B234177	<80.0	ug/L	80.0	80.0	EPA 200.7	10/19/23	10/20/23 10:09	AMO	U
Phosphorus as P	B234799	0.308	mg/L	0.0120	0.0120	EPA 200.7	11/30/23	12/1/23 10:09	AMO	
Hardness	B234177	<0.100	mg/L	0.100	0.100	SM 2340 B-2011	10/19/23	10/20/23 10:09	AMO	U

Dissolved Metals

Cadmium	B233966	0.021	ug/L	0.010	0.010	EPA 200.8	10/13/23	10/13/23 17:50	DMW	
Copper	B233966	8.2	ug/L	0.15	0.15	EPA 200.8	10/13/23	10/13/23 17:50	DMW	
Lead	B233966	0.095	ug/L	9.00E-3	9.00E-3	EPA 200.8	10/13/23	10/13/23 17:50	DMW	
Zinc	B233966	22.0	ug/L	0.50	0.50	EPA 200.8	10/13/23	10/13/23 17:50	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.



Quality Control Report

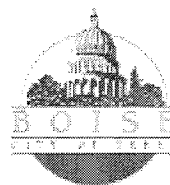
Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B234048									
Blank (B234048-BLK1)									
Total Dissolved Solids	<20	mg/L					10/13/2023	RKT	U
LCS (B234048-BS1)									
Total Dissolved Solids			95.4	90-110			10/13/2023	RKT	
Duplicate (B234048-DUP1) Source ID: RW00036-02									
Total Dissolved Solids					0.322	10	10/13/2023	RKT	
Batch: B234051									
Blank (B234051-BLK1)									
Turbidity	<0.3	NTU					10/11/2023	KMR	U
LCS (B234051-BS1)									
Turbidity			102	90-110			10/11/2023	KMR	
Duplicate (B234051-DUP1) Source ID: AC00322-01									
Turbidity					0.340	25	10/11/2023	KMR	
Batch: B234066									
Blank (B234066-BLK1)									
COD	<7	mg/L					10/12/2023	JAL	U
LCS (B234066-BS1)									
COD			99.3	90-110			10/12/2023	JAL	
Duplicate (B234066-DUP1) Source ID: RW00036-05									
COD					2.44	10	10/12/2023	JAL	
Duplicate (B234066-DUP2) Source ID: AC00322-01									
COD					1.20	10	10/12/2023	JAL	
Batch: B234067									
Blank (B234067-BLK1)									
BOD5	<2	mg/L					10/17/2023	RKT	U
LCS (B234067-BS1)									
BOD5			102	84.6-115.4			10/17/2023	RKT	
LCS (B234067-BS2)									
BOD5			107	84.6-115.4			10/17/2023	RKT	
Duplicate (B234067-DUP1) Source ID: BB03290-02									
BOD5					1.56	30	10/17/2023	RKT	D



Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B234076									
Blank (B234076-BLK1)									
Total Suspended Solids	<0.9	mg/L					10/12/2023	RKT	U
LCS (B234076-BS1)									
Total Suspended Solids			97.2	90-110			10/12/2023	RKT	
Duplicate (B234076-DUP1) Source ID: BB03292-01									
Total Suspended Solids					1.65	20	10/12/2023	RKT	
Duplicate (B234076-DUP2) Source ID: ST00053-02									
Total Suspended Solids					1.26	20	10/12/2023	RKT	
Batch: B234085									
Blank (B234085-BLK1)									
TKN	<0.2	mg/L					10/13/2023	EDM	U
LCS (B234085-BS1)									
TKN			97.9	80-120			10/13/2023	EDM	
Duplicate (B234085-DUP1) Source ID: WB02755-06									
TKN					1.60	20	10/13/2023	EDM	D
Matrix Spike (B234085-MS1) Source ID: WB02755-06									
TKN			89.1	80-120			10/13/2023	EDM	D
Matrix Spike Dup (B234085-MSD1) Source ID: WB02755-06									
TKN			89.8	80-120	0.285	20	10/13/2023	EDM	D
Batch: B234143									
Blank (B234143-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					10/17/2023	BAK	U
Blank (B234143-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					10/17/2023	BAK	U
LCS (B234143-BS1)									
Nitrate-Nitrite, as N			97.8	90-110			10/17/2023	BAK	
LCS (B234143-BS2)									
Nitrate-Nitrite, as N			96.0	90-110			10/17/2023	BAK	
Duplicate (B234143-DUP1) Source ID: BB03281-02									
Nitrate-Nitrite, as N					0.457	10	10/17/2023	BAK	
Duplicate (B234143-DUP2) Source ID: RW00037-01									
Nitrate-Nitrite, as N					0.344	10	10/17/2023	BAK	
Duplicate (B234143-DUP3) Source ID: WB02749-07									
Nitrate-Nitrite, as N					0.195	10	10/17/2023	BAK	D
Matrix Spike (B234143-MS1) Source ID: BB03281-02									
Nitrate-Nitrite, as N			97.7	90-110			10/17/2023	BAK	
Matrix Spike (B234143-MS2) Source ID: RW00037-01									
Nitrate-Nitrite, as N			91.7	90-110			10/17/2023	BAK	
Matrix Spike (B234143-MS3) Source ID: WB02749-07									
Nitrate-Nitrite, as N			92.9	90-110			10/17/2023	BAK	D



Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier

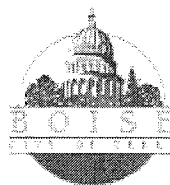
Wet Chemistry (Continued)

Batch: B234143 (Continued)

Matrix Spike Dup (B234143-MSD1)	Source ID: BB03281-02								
Nitrate-Nitrite, as N			95.1	90-110	1.49	10	10/17/2023	BAK	
Matrix Spike Dup (B234143-MSD2)	Source ID: RW00037-01								
Nitrate-Nitrite, as N			91.9	90-110	0.117	10	10/17/2023	BAK	
Matrix Spike Dup (B234143-MSD3)	Source ID: WB02749-07								
Nitrate-Nitrite, as N			91.6	90-110	0.567	10	10/17/2023	BAK	D

Batch: B234335

Blank (B234335-BLK1)									
Ammonia, as N	<0.035	mg/L					10/28/2023	MEC	U
LCS (B234335-BS1)									
Ammonia, as N			104	90-110			10/28/2023	MEC	
Duplicate (B234335-DUP1)	Source ID: BB03292-01								
Ammonia, as N					0.0151	10	10/28/2023	MEC	
Duplicate (B234335-DUP2)	Source ID: WB02765-06								
Ammonia, as N					1.26	10	10/28/2023	MEC	
Matrix Spike (B234335-MS1)	Source ID: BB03292-01								
Ammonia, as N			103	80-120			10/28/2023	MEC	
Matrix Spike (B234335-MS2)	Source ID: WB02765-06								
Ammonia, as N			108	80-120			10/28/2023	MEC	
Matrix Spike Dup (B234335-MSD1)	Source ID: BB03292-01								
Ammonia, as N			102	80-120	0.611	10	10/28/2023	MEC	
Matrix Spike Dup (B234335-MSD2)	Source ID: WB02765-06								
Ammonia, as N			109	80-120	0.658	10	10/28/2023	MEC	

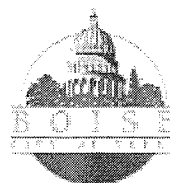


Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Dissolved Wet Chemistry									
Batch: B234046									
Blank (B234046-BLK1)									
Orthophosphate, as P	<0.003	mg/L					10/11/2023	JAL	U
LCS (B234046-BS1)									
Orthophosphate, as P			98.8	90-110			10/11/2023	JAL	
Duplicate (B234046-DUP1) Source ID: LS01715-02									
Orthophosphate, as P					2.17	10	10/11/2023	JAL	D
Duplicate (B234046-DUP2) Source ID: WB02755-08									
Orthophosphate, as P					0.279	10	10/11/2023	JAL	D
Matrix Spike (B234046-MS1) Source ID: LS01715-02									
Orthophosphate, as P			98.4	90-110			10/11/2023	JAL	D
Matrix Spike (B234046-MS2) Source ID: WB02755-08									
Orthophosphate, as P			100	90-110			10/11/2023	JAL	D
Matrix Spike Dup (B234046-MSD1) Source ID: LS01715-02									
Orthophosphate, as P			97.1	90-110	0.659	10	10/11/2023	JAL	D
Matrix Spike Dup (B234046-MSD2) Source ID: WB02755-08									
Orthophosphate, as P			100	90-110	0.0201	10	10/11/2023	JAL	D

Report Date: 12/04/2023 12:04

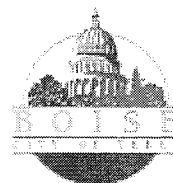


Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B234059									
Blank (B234059-BLK1)									
Mercury	<0.01	ug/L					10/13/2023	SAS	U
LCS (B234059-BS1)									
Mercury			99.0	85-115			10/13/2023	SAS	
Duplicate (B234059-DUP1) Source ID: AC00322-02									
Mercury					NR	20	10/13/2023	SAS	U
Duplicate (B234059-DUP2) Source ID: RW00036-06									
Mercury					NR	20	10/13/2023	SAS	U
Matrix Spike (B234059-MS1) Source ID: AC00322-02									
Mercury			108	70-130			10/13/2023	SAS	
Matrix Spike (B234059-MS2) Source ID: RW00036-06									
Mercury			111	70-130			10/13/2023	SAS	
Matrix Spike Dup (B234059-MSD1) Source ID: AC00322-02									
Mercury			107	70-130	0.688	20	10/13/2023	SAS	
Matrix Spike Dup (B234059-MSD2) Source ID: RW00036-06									
Mercury			110	70-130	0.399	20	10/13/2023	SAS	
Batch: B234105									
Blank (B234105-BLK1)									
Arsenic	<0.070	ug/L					10/19/2023	DMW	U
Cadmium	<0.010	ug/L					10/19/2023	DMW	U
Lead	<0.010	ug/L					10/19/2023	DMW	U
LCS (B234105-BS1)									
Arsenic			96.6	85-115			10/19/2023	DMW	
Cadmium			98.7	85-115			10/19/2023	DMW	
Lead			101	85-115			10/19/2023	DMW	
Duplicate (B234105-DUP1) Source ID: AC00322-01									
Arsenic					0.428	20	10/19/2023	DMW	
Cadmium					5.71	20	10/19/2023	DMW	
Lead					1.07	20	10/19/2023	DMW	
Matrix Spike (B234105-MS1) Source ID: AC00322-01									
Arsenic			96.8	70-130			10/19/2023	DMW	
Cadmium			99.6	70-130			10/19/2023	DMW	
Lead			99.3	70-130			10/19/2023	DMW	
Matrix Spike Dup (B234105-MSD1) Source ID: AC00322-01									
Arsenic			94.6	70-130	1.86	20	10/19/2023	DMW	
Cadmium			98.6	70-130	0.985	20	10/19/2023	DMW	
Lead			98.6	70-130	0.635	20	10/19/2023	DMW	



Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B234177									
Blank (B234177-BLK1)									
Calcium	<0.04	mg/L					10/20/2023	AMO	U
Magnesium	<80	ug/L					10/20/2023	AMO	U
Phosphorus as P	<0.012	mg/L					10/20/2023	AMO	U
LCS (B234177-BS1)									
Calcium			98.9	85-115			10/20/2023	AMO	
Magnesium			102	85-115			10/20/2023	AMO	
Phosphorus as P			105	85-115			10/20/2023	AMO	
Duplicate (B234177-DUP1) Source ID: LS01721-06									
Calcium					0.292	20	10/20/2023	AMO	
Magnesium					2.76	20	10/20/2023	AMO	
Phosphorus as P					5.61	20	10/20/2023	AMO	
Matrix Spike (B234177-MS1) Source ID: LS01721-06									
Calcium			77.5	70-130			10/20/2023	AMO	
Magnesium			91.3	70-130			10/20/2023	AMO	
Phosphorus as P			97.6	70-130			10/20/2023	AMO	
Matrix Spike Dup (B234177-MSD1) Source ID: LS01721-06									
Calcium			98.3	70-130	9.81	20	10/20/2023	AMO	
Magnesium			103	70-130	10.2	20	10/20/2023	AMO	
Phosphorus as P			112	70-130	11.9	20	10/20/2023	AMO	
Batch: B234661									
Blank (B234661-BLK1)									
Phosphorus as P	<0.012	mg/L					11/22/2023	AMO	U
LCS (B234661-BS1)									
Phosphorus as P			100	85-115			11/22/2023	AMO	
Duplicate (B234661-DUP1) Source ID: BB03382-01									
Phosphorus as P					2.18	20	11/22/2023	AMO	
Matrix Spike (B234661-MS1) Source ID: BB03382-01									
Phosphorus as P			94.0	70-130			11/22/2023	AMO	
Matrix Spike Dup (B234661-MSD1) Source ID: BB03382-01									
Phosphorus as P			93.7	70-130	0.164	20	11/22/2023	AMO	



Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier

Total Metals (Continued)

Batch: B234799

Blank (B234799-BLK1)

Phosphorus as P	<0.012	mg/L					12/01/2023	AMO	U

LCS (B234799-BS1)

Phosphorus as P			104	85-115			12/01/2023	AMO	

Duplicate (B234799-DUP1) Source ID: EP00294-01

Phosphorus as P					0.399	20	12/01/2023	AMO	

Matrix Spike (B234799-MS1) Source ID: EP00294-01

Phosphorus as P			101	70-130			12/01/2023	AMO	

Matrix Spike Dup (B234799-MSD1) Source ID: EP00294-01

Phosphorus as P			101	70-130	0.280	20	12/01/2023	AMO	

Dissolved Metals

Batch: B233966

Blank (B233966-BLK1)

Cadmium	<0.010	ug/L					10/13/2023	DMW	U
Copper	<0.15	ug/L					10/13/2023	DMW	U
Lead	<0.0090	ug/L					10/13/2023	DMW	U
Zinc	<0.50	ug/L					10/13/2023	DMW	U

LCS (B233966-BS1)

Cadmium			91.2	85-115			10/13/2023	DMW	
Copper			92.8	85-115			10/13/2023	DMW	
Lead			93.2	85-115			10/13/2023	DMW	
Zinc			95.4	85-115			10/13/2023	DMW	

Duplicate (B233966-DUP1) Source ID: NP00059-05

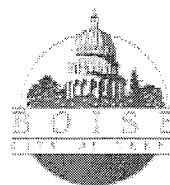
Cadmium					NR	10	10/13/2023	DMW	U
Copper					0.902	10	10/13/2023	DMW	
Lead					9.73	10	10/13/2023	DMW	
Zinc					1.54	10	10/13/2023	DMW	

Matrix Spike (B233966-MS1) Source ID: NP00059-05

Cadmium			94.2	70-130			10/13/2023	DMW	
Copper			87.9	70-130			10/13/2023	DMW	
Lead			90.5	70-130			10/13/2023	DMW	
Zinc			91.6	70-130			10/13/2023	DMW	

Matrix Spike Dup (B233966-MSD1) Source ID: NP00059-05

Cadmium			93.3	70-130	0.903	10	10/13/2023	DMW	
Copper			88.5	70-130	0.546	10	10/13/2023	DMW	
Lead			90.2	70-130	0.360	10	10/13/2023	DMW	
Zinc			92.5	70-130	0.902	10	10/13/2023	DMW	



Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628

Stormwater-PI

Kristen Cluisholm
Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix		Type		BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ - D	Total Containers
							Water		Grab	Composite																
AC00322																										
-01	10/10/23	10/10/23	1700	0900	231010-03-WC	KE	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
-02	10/10/23	10/10/23	1713	1150	231010-14-WC	KE	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristen Cluisholm	10/11/23 1242	Sandra We	Low volume samples. Please try to split for optimum number of analysis listed above.
			AC00322-01: no dissolved parameters collected.
			Sample AC00322-02 correct name is 231010-14 WC.

See attached email. -Alt
on back, AC00322 WY24

April Griffith

From: Kristen Chisholm <Kchisholm@achdidaho.org>
Sent: Wednesday, October 11, 2023 1:33 PM
To: April Griffith
Cc: Steven Turner; Monica Lowe
Subject: [External] Re: Site ID

Hi April,

Sorry, the correct ID is 14.

Thank you!

On Oct 11, 2023, at 1:30 PM, April Griffith <agriffith@cityofboise.org> wrote:

Caution: This is an external email and has a suspicious subject or content. Please take care when clicking links or opening attachments. When in doubt, contact your IT Department

Hi Steven,

Sorry, I forgot to include you in this email.

Thanks,
April

From: April Griffith
Sent: Wednesday, October 11, 2023 1:30 PM
To: Kristen Chisholm <Kchisholm@achdidaho.org>
Cc: Monica Lowe <mlowe@achdidaho.org>
Subject: Site ID

Hi Kristen,

One of the sites on the COC says -12, but the container says -14. Which is correct?

Thanks,
April

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 1 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
#1 Lims#: <u>AC00322-01</u> Location: <u>ACSTIC</u> Sample Date: <u>10-11-23</u> Sample ID: <u>-03</u>	Split Date: <u>10-11-23</u> Start Split: <u>1300</u> Start Filter: <u>N/A</u> Comp Time: <u>N/A</u> Analyst: <u>EDM/DKT</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>CC00047-20</u> Comp Jug: <u>N/A</u> SS Tubing: <u>CC00047-39</u> SS Helper: <u>SSA2</u> Stir Bar: <u>SSX047-22</u> Connector: <u>CC00046-06</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☐ TDS ☐ ☒ COD ☐	High capacity 0.45µm No DISS. Parameters
#2 Lims#: <u>AC00322-02</u> Location: <u>ACSTIC</u> Sample Date: <u>10-11-23</u> Sample ID: <u>-14</u>	Split Date: <u>10-11-23</u> Start Split: <u>1311</u> Start Filter: <u>1315</u> Comp Time: <u>N/A</u> Analyst: <u>EDM/DKT/SAS</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>CC00047-26</u> Comp Jug: <u>N/A</u> SS Tubing: <u>CC00047-26</u> SS Helper: <u>SSA4</u> Stir Bar: <u>CC00047-22</u> Connector: <u>CC00041-31</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☐ TDS ☐ ☒ COD ☐	High capacity 0.45µm
#3 Lims#: <u>No</u> Location: <u>Other</u> Sample Date: <u>Other</u> Sample ID: <u>Samples</u>	Split Date: <u> </u> Start Split: <u> </u> Start Filter: <u> </u> Comp Time: <u> </u> Analyst: <u> </u>	Filter: ☒ Voss ☐ 0.45µm ☐ 1.0µm ☐ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u> </u> Comp Jug: <u> </u> SS Tubing: <u>CC00044-92</u> SS Helper: <u>SSA5</u> ↓ Stir Bar: <u>CC00047-25</u> Connector: <u>CC00039-71</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☐ TDS ☐ ☒ COD ☐	High capacity 0.45µm
#4 Lims#: <u> </u> Location: <u> </u> Sample Date: <u> </u> Sample ID: <u> </u>	Split Date: <u> </u> Start Split: <u> </u> Start Filter: <u> </u> Comp Time: <u> </u> Analyst: <u> </u>	Filter: ☒ Voss ☐ 0.45µm ☐ 1.0µm ☐ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u> </u> Comp Jug: <u> </u> SS Tubing: <u>CC00047-18</u> SS Helper: <u>SSA7</u> ↓ Stir Bar: <u>CC00041-AC</u> Connector: <u>CC00040-06</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☐ TDS ☐ ☒ COD ☐	High capacity 0.45µm
#5 Lims#: <u> </u> Location: <u> </u> Sample Date: <u> </u> Sample ID: <u> </u>	Split Date: <u> </u> Start Split: <u> </u> Start Filter: <u> </u> Comp Time: <u> </u> Analyst: <u> </u>	Filter: ☒ Voss ☐ 0.45µm ☐ 1.0µm ☐ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u> </u> Comp Jug: <u> </u> SS Tubing: <u>CC00047-39</u> SS Helper: <u>SS9</u> ↓ Stir Bar: <u>CC00044-AD</u> Connector: <u>CC00039-71</u>	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☐ TDS ☐ ☒ COD ☐	High capacity 0.45µm

CC00040-06

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 2 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: _____ Location: <u>NO</u> Sample Date: <u>other</u> Sample ID: <u>samples</u>	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: _____ Comp Jug: _____ SS Tubing: <u>CC00039-99</u> SS Helper: <u>SS17</u> ↓ Stir Bar: <u>CC00044-AD</u> Connector: <u>CC00041-06</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	<u>High capacity 0.45µm</u>
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	

#6



Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 801.316.9859

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2024

Project No.: 159103

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for November 19, 2023

Date: February 14, 2023

To: Monica Lowe

Cc: Steven Turner

Kristen Chisholm

From: Zuly Lapa, Project Engineer

Prepared by: Zuly Lapa, EIT, Project Engineer

Reviewed by: Melissa Jannusch, PE, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 10, 2023. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The Environmental Protection Agency Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2024 (October 1, 2023, through September 30, 2024). The following storm event report summarizes stormwater sampling results from the November 19, 2023, storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2024 Phase I Stormwater Outfall Monitoring. When samples are qualified, additional samples will be attempted from subsequent storms to collect unqualified samples.

Table 2-1. WY 2024 Samples Collected					
Date	Lucky	Whitewater	Main	Americana	AS_6
October 10, 2023	G, C ^{1,2}	G	--	G, C ³	--
November 19, 2023	G, C	G, C	G, C	G ⁴ , C	G, C
Unqualified Samples:	2G, 1C	2G, 1C	1G, 1C	2G, 1C	1G, 1C
Samples Remaining:	1G, 2C	1G, 2C	2G, 2C	1G, 2C	2G, 2C

Notes:

-- = no samples taken

C = composite sample

G = grab sample

¹ Composite samples qualified due to lack of representativeness (50% – 75%).

² Incomplete water quality analysis due to low composite sample volume.

³ Composite samples qualified due to lack of representativeness (50% – 75%) of the calculated flow volume.

⁴ Grab sample qualified due to incomplete field parameter collection.

Section 3: Storm Event Summary

The November 19, 2023, storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A summary of the forecast on which monitoring decisions were based is detailed below. The sampling event communication form that describes the forecast and summarizes the decision-making process from November 19, 2023, is included in Attachment A for reference.

Saturday, November 18, 2023 (Sampling Event Communication and Set Up)

- On the afternoon of November 18, the National Weather Service issued a forecast for widespread rain in the Boise area, starting November 18 at 2100 and ending on November 19 at 0000. The chance of precipitation was greater than 80%, with 0.20 to 0.30 inches of precipitation forecasted.
- Setup was accomplished in the afternoon of November 18. An expected precipitation depth of 0.11 inches was used to set trigger volumes at monitoring stations. A runoff calculations worksheet showing how the trigger volumes were calculated is included in Attachment A.

Sunday, November 19, 2023 (Storm Event)

- Moderate rain first started at approximately November 19 at 0000 and ended at 1642.
- Precipitation totals ranged between 0.42 and 0.61 inches at local rain gauges.

Flow measurements and precipitation data are listed in Table 1 along with a sampling summary. Hydrograph for the Lucky, Whitewater, Main, Americana and AS_6 site showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Main, Americana and AS_6 monitoring stations were set up on November 18, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programmed into the Whitewater and Americana flowmeters. A site-specific velocity cutoff value was programmed into Lucky, Main, and AS_6 flowmeter. Setup and sampling information are included in Table 1. The field forms completed during setup/shutdown and sampling are included in Attachment C.

Grab Samples

Two, two-member team mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on November 19 at 0110. Grab samples for Lucky, Whitewater, Main, and Americana were submitted to the West Boise Water Quality Lab (WQL) at 0758 on November 19. The AS_6 grab sample was submitted at 1342 on November 19 to the WQL.

Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment D.

Composite Samples

Composite samples were collected at the Whitewater, Main, and Americana monitoring station and submitted to the WQL at 1716 on November 19. The composite samples at the AS_6 monitoring station was submitted at 1342 and the Lucky monitoring station at 1603 on November 19 to the WQL.

Analytical results are shown in Table 2 and pollutant loading estimates for the event are detailed in Table 3. Laboratory analytical reports are included in Attachment D.

Section 4: Quality Assurance/Quality Control

A summary of quality control samples collected during the November 19, 2023, storm event is presented below in Table 4-1. A field blank and a field duplicate were collected from the Americana monitoring station. The analytical results for these samples are included in Table 4.

Table 4-1. Quality Control Samples			
Sample ID	Sample Type	Parent Sample	Conclusions
231119-14-001	Field blank	Americana grab	No <i>E. coli</i> detection was reported in the field blank.
231119-14-101	Field duplicate	Americana grab	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A.

An acceptable composite sample represents at least 75 percent of the total discharge or at least 6 hours of the storm duration. All composite samples met the criteria.

The acceptance and performance criteria for analytical and non-analytical criteria were met for this storm event.

Section 5: Notes and Recommendations

Whitewater

The small sampler battery died at approximately 0537 on Bottle No. 2. The battery was replaced, and the sampler program was then restarted at 0800 and continued until the end of the storm event. The battery issue resulted due to setting up the sampler program earlier in the week. It is advised to check on the small battery prior to the storm event if set-up is completed a day earlier.

AS_6

The AS_6 composite samples had two distribution errors at 0650 and 0740 on Bottle No. 2. The AS_6 sampler battery later died after taking the last composite sample but was then replaced. The sample program was restarted at 0826. There was also a No-Liquid-Error at 0953, but no succeeding errors occurred until the end of the event. It is advised to check on the small battery prior to the storm event if set-up is complete a day earlier.

Data Tables



TAB-1

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	YES	YES	YES	YES
Composite samples collected and submitted?	YES	YES	YES	YES	YES
Trigger volume (gal or ft ³)	2895 gal	800 ft ³	3411 gal	2960 ft ³	221 ft ³
Velocity cutoff (fps)	0.02	--	0.02	--	0.02
Sampler enable condition (in)	--	Level > 1.9 "	--	Level > 6.96 "	--
Runoff start time	0038	0102	0029	0000	0251
Grab sample collection time	0156	0247	0122	0151	0620
Composite sample stop time	1328	1528	1442	1407	1221
Runoff stop time	1500	1552	1446	1642	1615
Volume of Discharge Sampled (ft ³)	17,699	73,819	28,140	251,136	19,247
Total runoff volume (ft ³)	18,782	81,522	35,160	317,217	21,217
Percent of storm flow sampled (%)	94%	91%	80%	79%	91%
Composite sample duration (hrs)	11	13	13.5	12.5	9
Storm Precipitation (in)	0.42	0.61	0.50	0.50/0.58	0.50/0.58
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	46	82	60	88	81
Number of composite bottles filled	2	3	3	4	4
Composite sample volume (Approx.; ml)	27,250	36,750	36,000	50,000	54,500

Notes:

-- = No data.

Table 2. Field and Analytical Data Summary																											
Monitoring Station	Sample Date	Sample ID Grab	Field Parameters					E. coli	Sample ID Composite	Analytical Parameters																	
			Dissolved Oxygen	pH	Conductivity	Temperature				BOD ₅	COD	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total
			mg/L	S.U.	uS/cm	C	mpn/100 mL		mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
Lucky	11/19/2023	231119-03-WG	5.09	7.27	506.44	15.7	2.0	231119-03-WC	59.5	137	35.8	8.6	8.63	136	0.710	0.538	0.530	0.145	1.76	0.93	0.012	0.030	3.5	0.085	0.33	<0.0100	32.7
Whitewater	11/19/2023	231119-11-WG	5.82	7.34	460.32	12.96	99.0	231119-11-WC	61.9	167	45.0	19.7	27.3	180	0.958	0.768	0.527	0.182	2.07	1.7	<0.0100	0.041	5.0	0.21	2.2	<0.0100	32.3
Main	11/19/2023	231119-12-WG	9.48	7.64	174.43	10.54	30.9	231119-12-WC	19.9	61.0	19.3	11.7	16.2	61.0	0.226	0.167	0.610	0.246	1.14	0.66	0.015	0.045	2.7	0.12	1.7	<0.0100	25.9
Americana	11/19/2023	231119-14-WG	-- ^{3f}	-- ^{3f}	-- ^{3f}	14.16	1340.0	231119-14-WC	36.5	94.0	57.8	15.0	21.7	153	0.504	0.402	0.454	0.614	1.27	2.1	0.022	0.061	4.0	0.11	1.9	<0.0100	27.2
AS_6	11/19/2023	231119-206-WG	9.44	7.18	184.28	9.04	1732.9	231119-206-WC	162	329	43.3	21.1	28.7	263	2.06	1.71	0.563	0.136	3.17	1.7	0.029	0.059	8.5	0.93	3.3	<0.0100	61.8

Notes:
-- = No data.
^{3f} Grab sample qualified due to incomplete field parameter collection.

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
Lucky	11/19/2023	10.1	0.832	0.621	0.170	2.06
Whitewater	11/19/2023	139	4.87	2.68	0.926	10.5
Main	11/19/2023	35.5	0.496	1.34	0.540	2.50
Americana	11/19/2023	430	9.98	8.99	12.2	25.1
AS_6	11/19/2023	38.0	2.73	0.746	0.180	4.20

Table 4. QC Sample Summary				
Date	Parent Sample	Sample ID	Type	E. coli
				mpn/100 mL
11/19/2023	231119-14-WG	231119-14-001	Field Blank	<1.0
11/19/2023	231119-14-WG	231119-14-101	Field Duplicate	866.4
Calculated parent/duplicate RPD				4%
Allowable RPD				40%

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 11/18/2023	Time: 2:30 PM	Initials: ST
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Yes

Past 72 hr Precip	0.00"
Date and time of expected event	11/18/2023
Expected amount of precipitation	0.2 – 0.3"
Percent chance of precipitation	90%
Percent chance of >0.10" over 12 hours	Upper 80%

<u>NWS Update</u> Steven from the NWS said that the rain will be moving in between 9:00 PM and midnight. It will taper off around 6:00 – 7:00 AM on Sunday morning. Between those times, their models are predicting .16 - .42". I asked if he could narrow the amount down and he said 0.26" is the average. The heavier rain will start later around 11:00 PM to 1:00 AM.

<u>Targeted Station & Samples</u>					
Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☒ Grab	☒ Grab	☒ Grab	☒ Grab	☒ Grab
☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite

<u>Type of Forecasted Precipitation</u>		
☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☐ Thunder Showers	☐ Snowmelt
☐ Other:		

<u>Reasons for Not Targeting a Forecasted Storm and/or Stations</u>
☐ Holiday
☐ Waiting on Antecedent Dry Period – Expires:
☐ Equipment Concerns:
☐ Other:

<u>Text Forecast</u>

<u>Forecast Discussion</u>

<u>Hourly Forecast</u>

Storm Event QA/QC Checklist – Phase I

STORM DATE 11/19/23

A. Event and Data Completeness

	Yes	No	N/A	Notes
1. Field data sheets filled out completely and clearly	X			
2. Field parameters reviewed, and any problems/issues addressed	X			Noted missed parameters in sample status
3. All samples collected as specified	X			
4. All samples delivered to lab promptly (review chain of custody rpts)	X			
5. Inconsistencies/clarifications discussed with sampling team member	X			Americana field parameters were incomplete
6. All analytical reports from lab received	X			

B. Validation and Verification Methods

	Yes	No	N/A	Notes
1. Outliers and unexpected values discussed with lab			X	
2. Appropriate analytical methods used	X			
3. All lab QA samples were within method acceptance criteria	X			
4. All samples reviewed and data qualifiers assigned if needed	X			
5. Data quality objective achieved	X			

C. Specific Storm and Sample QA/QC Criteria

	Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)	0.00"	0.00"	0.00"	0.00"	0.00"	< 0.11" in 72 hrs	X		
2. Precipitation (inches)	0.42	0.61	0.50	0.50 0.58	0.50 0.58	> 0.10"	X		
3. Sampled amount (% of total run-off)	94%	91%	80%	79%	91%	>= 75% or >= 6 hrs: no qualifier >= 50% and <75%: qualify < 50%: reject	X		
4. Composite sample duration (hours)	11	13	13.5	12.5	9				
4. Ecoli sample holding time (hours)	7.5	6.5	7.5	7.0	7.5	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X		
5. Filtering of samples for dissolved parameter analysis (hours)	3.0	2.5	3.5	3.5	1.5	<= 24 hrs: no qualifier > 24 hrs.: reject	X		

D. Notes

Americana - Field parameters (DO, pH, cond) not recorded during grab sample collection.

Reviewed by

Steven Turner

Date

2/12/24

Approved by

Monica Lowe

Date

2/12/24

Storm Runoff Estimates and Trigger Volumes

Step 1. Enter runoff coefficients in yellow cells.

Step 2. Enter expected precipitation depth (in) in blue cell.

Step 3. Read trigger volumes (**bold**) in green cells.

Expected Precipitation Depth = 0.11

Aliquots per Sample = 17

Site	Area (ac)	Using RC calculated from flow data		
		RC	Expected Vol (ft ³)	Trigger Vol (ft ³)
Lucky	105	0.157	6582.5	387
Whitewater	498	0.069	13621.3	801
Main	79	0.246	7760.0	456
Main Alt	60	0.200	4791.6	282
Americana	875	0.144	50311.8	2960
AS_6	204	0.046	3747.0	220
State	34	0.160	2172.2	128

Notes:

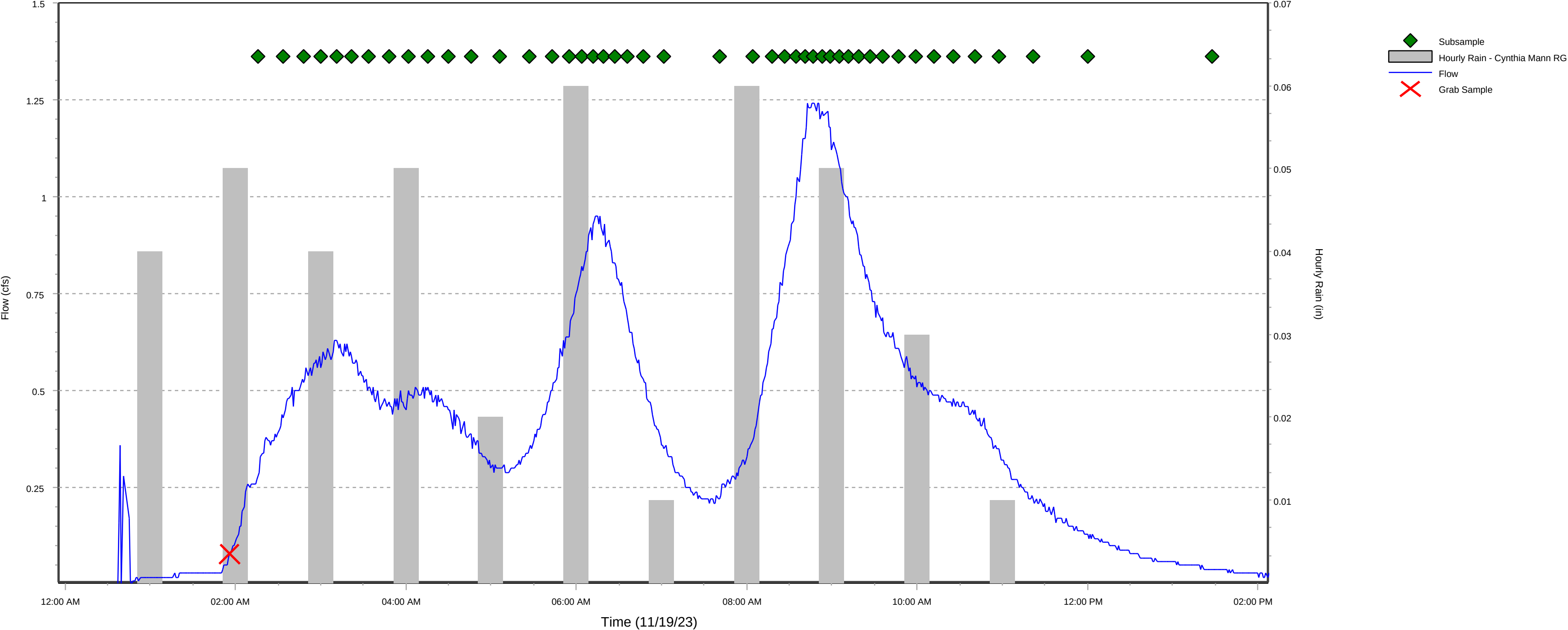
Calculated RC = Average ($\text{precip (ft)} / [\text{volume (ft}^3\text{)} \times \text{area (ft}^2\text{)}]$)

Where precip (ft) is the measured amount from local rain guage, and $\text{volume (ft}^3\text{)}$ is the measured discharge, and $\text{area (ft}^2\text{)}$ is the watershed area

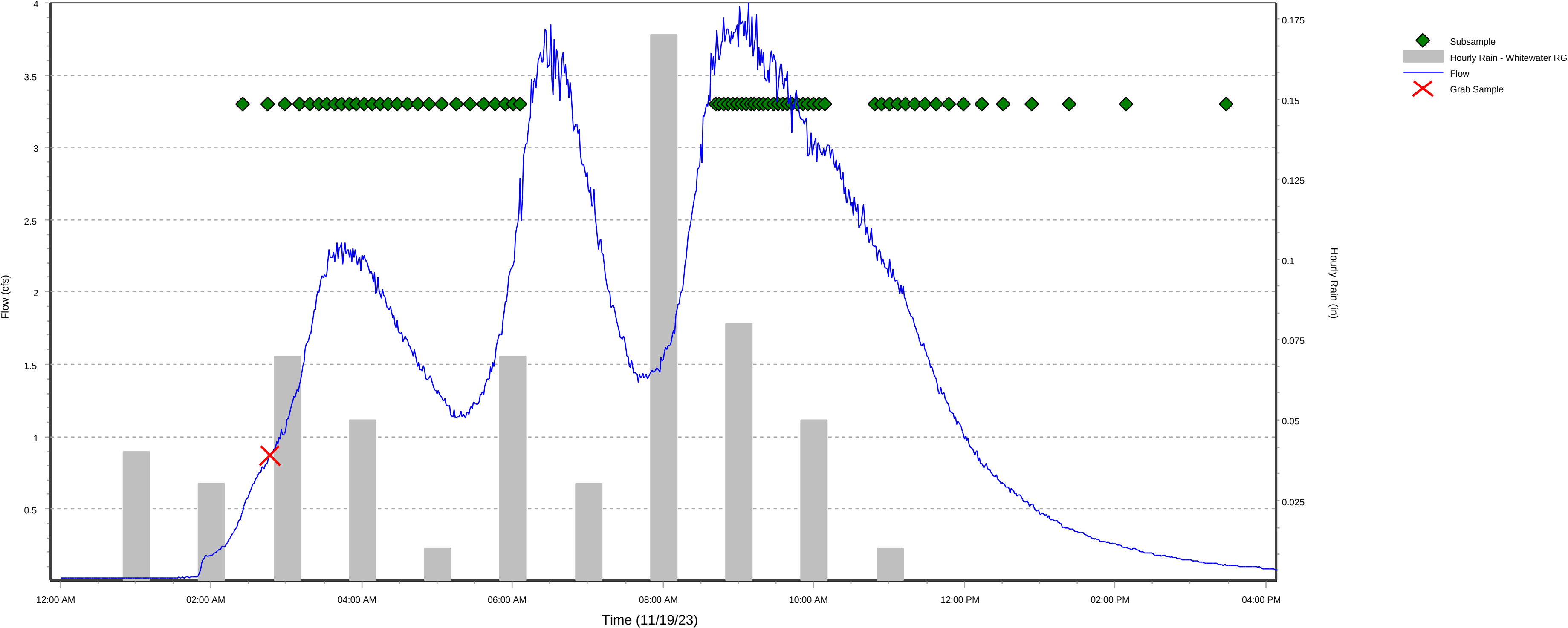
Expected volume (ft³) = RC x expected precip (ft) x area (ft²)

Attachment B: Storm Event Hydrographs

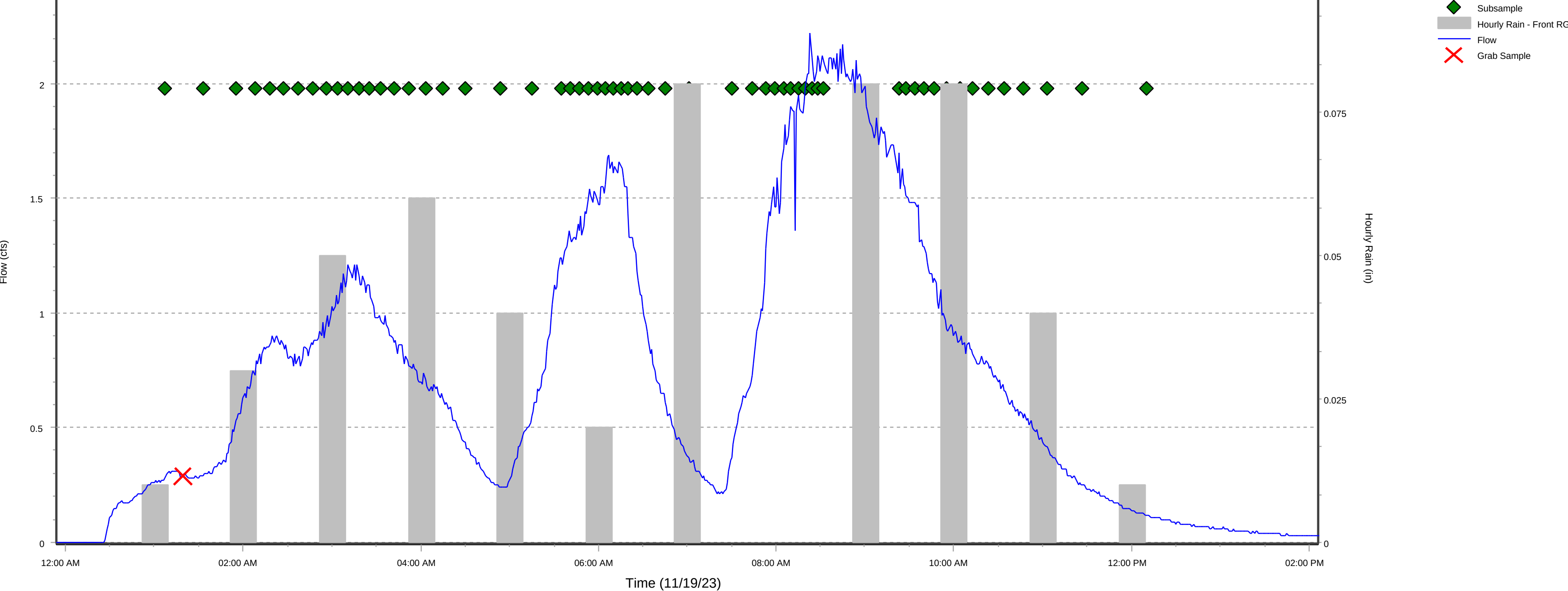
Lucky Hydrograph



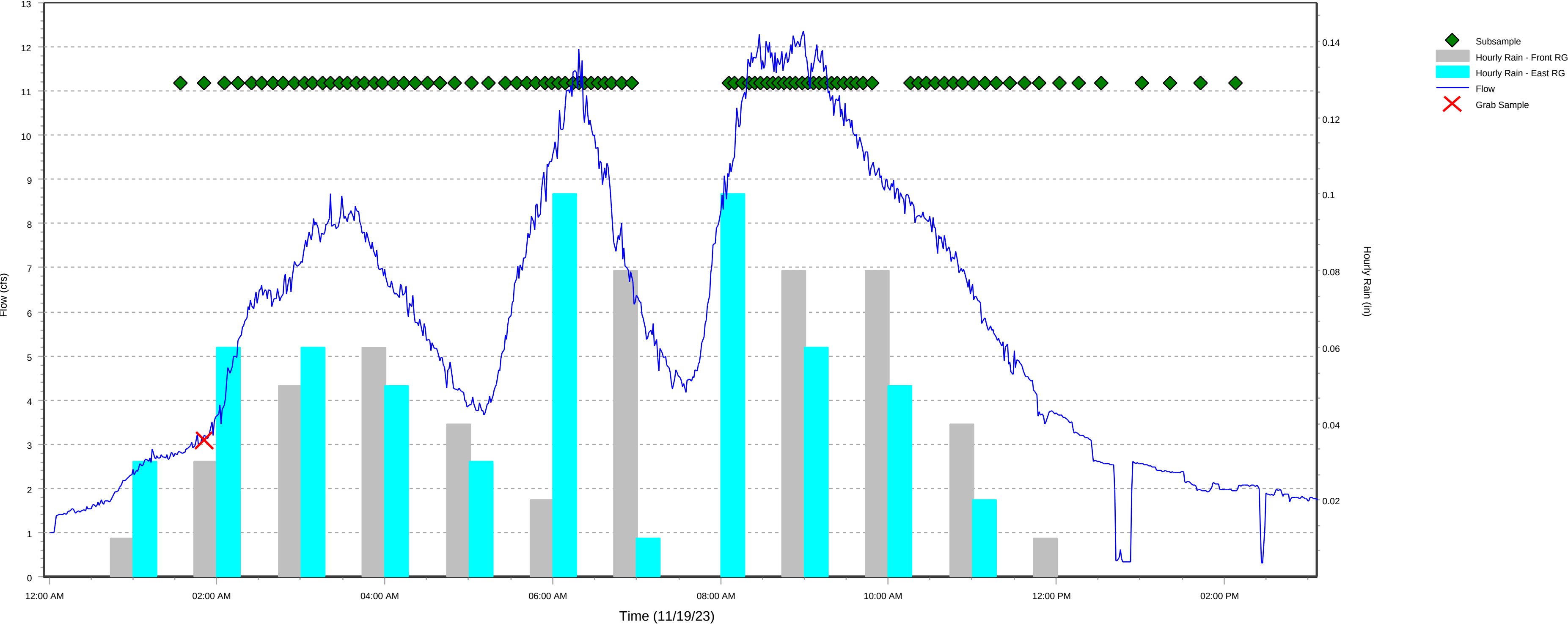
Whitewater Hydrograph



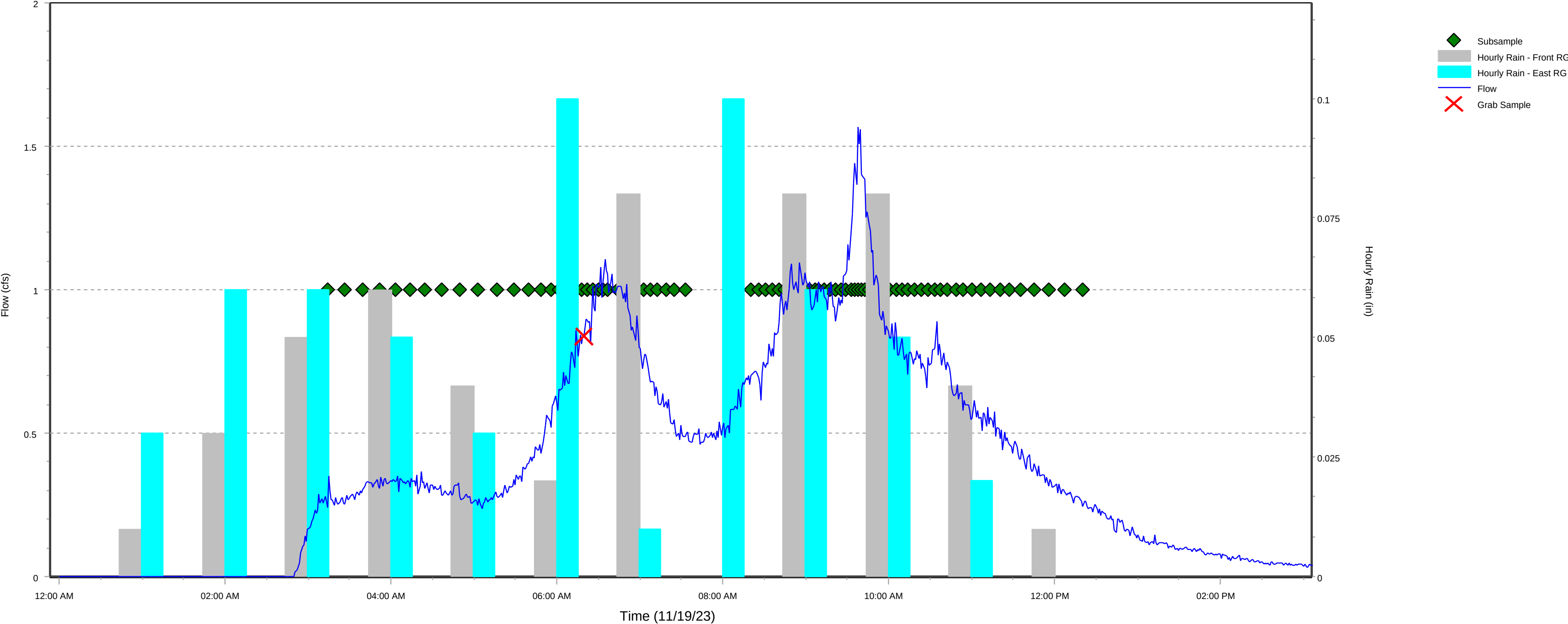
Main Hydrograph



Americana Hydrograph



AS_6 Hydrograph



Attachment C: Field Forms

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

LOCATION: Lucky

SET UP

Personnel: ST. KC

Date/Time

On-Site: 11/17/23 13:34

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
13:47	1.8	73.34	1.36	13.1
13:52	1.7	0.00	0	
Enable Condition or Velocity Cutoff:			vc ~~2895 gal~~ 0.02	
Deadband:			1.0	
Trigger Volume:			2895 gal	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☐ Start flowmeter program and sampler program
- ☐ Verify running

Comments: Readings when first turned on, now reading 0's after updating
No flow in pipe.

SHUT DOWN

Personnel: ST. KC

Date/Time

On-Site: 11/19/23 15:18

Time	Level (in)	Flow (cfs) GPM	Velocity (fps)	Total (cf)	Battery (V)
15:22	1.91	5.76	0.1		12.8
Downloaded to:		USB-3 @ 5:22			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Ludox
 Personnel: ST, KC

Bottle 1 of 2
 Date/Time On-Site: 11/19/23 710

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>231119-63</u> -WC
Approx Sample Volume (mL): <u>14000mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>11/19/23 216</u>	<u>Success</u>	13	<u>506</u>	
2	<u>234</u>		14	<u>527</u>	
3	<u>248</u>		15	<u>543</u>	
4	<u>300</u>		16	<u>555</u>	
5	<u>311</u>		17	<u>604</u>	
6	<u>322</u>		18	<u>612</u>	
7	<u>334</u>		19	<u>619</u>	
8	<u>348</u>		20	<u>627</u>	
9	<u>402</u>		21	<u>6336</u>	
10	<u>416</u>		22	<u>647</u>	
11	<u>426</u>		23	<u>702</u>	
12	<u>446</u>		24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle, add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 7:12</u> ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Lucy
 Channel: ST. KC

Bottle 2 of 2

Date/Time On-Site: _____

☒ Halt Sampler program

☒ Put lid on sample bottle; label sample bottle

Sample ID:	23119-03	-WC
Approx Sample Volume (mL):	13250	
Clarity (ex. Clear, Cloudy, Silty):	Cloudy	
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan	
QA/QC Sample ID:	-103	(Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	7/19/23 741	Success	13	987	
2	804		14	936	
3	815		15	947	
4	827		16	959	
5	839		17	1012	
6	841		18	1026	
7	847		19	1041	
8	853		20	1058	
9	859		21	1122	
10	905		22	1200	
11	912		23	1328	✓
12	919		24		

Comments:

If sampling is complete:

- ☒ Power off sampler
- ☒ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Lucky

Personnel: Hannah Johnson + Gabi Karoa

Date/Time On-Site: 11/19/2023 1:30 AM

Flow Meter Current Status

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
2:06 ^{am}	2.11	9.46 ^{am}	0.15	12.8		

Grab Information

	Sample ID	Date	Time	Labeled?
Site <i>E. Coli</i>	231119-03 -WG	11/19/23	01:38 am	☒
Field Duplicate <i>E. Coli</i>	-101			☐
Field Blank <i>E. Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters

Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP09	0156 am	15.70	5.09	7.27	506.74

Sampler Current Status

First Subsample Date/Time	N/A @ 206 am
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

TATION: Whitewater

SET UP

Personnel: KC ST

Date/Time
On-Site: 11/17/23 1418

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1418	0.88	0.02	0.28	12.8
Enable Condition:		1.9		
Hysteresis:		1		
Flow Pulse Interval:		800 cfs		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☐ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☐ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time Set w/ keypad
- ☐ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: ST

Date/Time
On-Site: 11/20 1248

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1259	3.08	0.495	1.083	12.6
Downloaded to:		Steven's USB		

On-Site

- ☐ Replace flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 1248
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Whitewater
 Personnel: ST, KC

Bottle 1 of 3
 Date/Time On-Site: 11/14/2023 502

☒ Halt sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>231119 - 11</u> -WC
Approx Sample Volume (mL):	<u>11750 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>11/14/23 224</u>	<u>Success</u>	13	<u>408</u>	
2	<u>244</u>		14	<u>414</u>	
3	<u>258</u>		15	<u>421</u>	
4	<u>309</u>		16	<u>428</u>	
5	<u>318</u>		17	<u>436</u>	
6	<u>325</u>		18	<u>444</u>	
7	<u>332</u>		19	<u>453</u>	
8	<u>338</u>		20	<u>503</u>	
9	<u>344</u>		21		
10	<u>350</u>		22		
11	<u>355</u>		23		
12	<u>401</u>		24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/14/23 505</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: KC, ST

Bottle 2 of 3
 Date/Time On-Site: 11/19/23 ~800

☐ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>23119-11</u> -WC
Approx Sample Volume (mL):	<u>15500 ml</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 514</u>	<u>Success</u>	13		
2	<u>526</u>	<u>↓</u>	14		
3	<u>537</u>	<u>Power Failed</u>	15		
4	<u>546</u>	<u>↓</u>	16		
5	<u>554</u>	<u>↓</u>	17		
6	<u>600</u>	<u>↓</u>	18		
7	<u>606</u>	<u>↓</u>	19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments: Used same bottle with 24 samples on next Page.

If sampling is complete: ☐ Power off sampler ☐ Verify Flowmeter is running ☐ Add ice to sample transport cooler ☐ Complete COC form; arrange transport to lab	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ <u>KC</u> ~~Install new 15L bottle; add ice~~ <u>Used same bottle w/ two samples.</u> ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 ~800</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater

Personnel: KC, ST

Bottle 2 of 3

Date/Time On-Site: 11/19/23 1045

☒ Halt Sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>231119-11</u> -WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 821 KC 821</u>	<u>Success</u>	13	<u>923</u>	
2	<u>844</u>		14	<u>927</u>	
3	<u>848</u>		15	<u>931</u>	
4	<u>851</u>		16	<u>935</u>	
5	<u>855</u>		17	<u>938</u>	
6	<u>858</u>		18	<u>942</u>	
7	<u>902</u>		19	<u>946</u>	
8	<u>905</u>		20	<u>951</u>	
9	<u>909</u>		21	<u>955</u>	
10	<u>912</u>		22	<u>959</u>	
11	<u>916</u>		23	<u>1004</u>	
12	<u>920</u>		24	<u>1008</u>	

Comments: Used same bottle with 2 samples on previous page.

If sampling is complete: ☐ Power off sampler ☐ Verify flowmeter is running ☐ Add ice to sample transport cooler ☐ Complete COC form; arrange transport to lab	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 1047</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: KC, ST

Bottle 3 of 3

Date/Time On-Site: 11/19/23 1425

☒ Halt Sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>231119-11</u> -WC
Approx Sample Volume (mL): <u>9500</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Murky / cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 1048</u>	<u>Success</u> ~~1048~~ <u>KC</u>	13	<u>1253</u>	<u>Success</u>
2	<u>1054</u>	<u>↓</u> <u>1052</u>	14	<u>1323</u>	<u>↓</u>
3	<u>1100</u>	<u>↓</u>	15	<u>1408</u>	<u>↓</u>
4	<u>1106</u>	<u>↓</u>	16	<u>1528</u>	<u>↓</u>
5	<u>1113</u>	<u>↓</u>	17		
6	<u>1120</u>	<u>↓</u>	18		
7	<u>1128</u>	<u>↓</u>	19		
8	<u>1137</u>	<u>↓</u>	20		
9	<u>1147</u>	<u>↓</u>	21		
10	<u>1159</u>	<u>↓</u>	22		
11	<u>1213</u>	<u>↓</u>	23		
12	<u>1231</u>	<u>↓</u>	24		

Comments:

If sampling is complete:

- ☒ Power off sampler
- ☒ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☒ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: White Water

Personnel: HRJ GTK

Date/Time On-Site: 11/19/23 2:35 am

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
02:51 am	3.91	0.94	1.44			

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E. Coli</i>	231119-11 -WG	11/19/23	02:39 am	☒
Field Duplicate <i>E. Coli</i>	-101			☐
Field Blank <i>E. Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP09	02:47 am	12.96	5.82	7.34	460.32

Sampler Current Status	
First Subsample Date/Time	2:24 am 11/19/23
Last Subsample Date/Time	2:44 11/19
# of Subsamples taken	32

Comments:

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

ATION: Main

SET UP

Personnel: KC, ST

Date/Time
On-Site: 11/17/23 1507

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1511	0.85	0.00	0.00	12.8
Enable Condition or Velocity Cutoff:			0.02	
Deadband:			1	
Trigger Volume:			3411	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: ST

Date/Time
On-Site: 11/20 12:13

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1232	1.37	0	0		12.4
Downloaded to:		Frontier USB			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Main
 Personnel: ST. KC

Bottle 1 of 3
 Date/Time On-Site: 11/19/23 0524

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>231119-12</u> -WC
Approx Sample Volume (mL): <u>12500 ml</u>
Clarity (ex. Clear, Cloudy, Silty): <u>clear/silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>11/19/2023 107</u>	<u>Success</u>	13	<u>325</u>	
2	<u>133</u>		14	<u>333</u>	
3	<u>155</u>		15	<u>342</u>	
4	<u>208</u>		16	<u>352</u>	
5	<u>218</u>		17	<u>403</u>	
6	<u>227</u>		18	<u>415</u>	
7	<u>237</u>		19	<u>430</u>	
8	<u>247</u>		20	<u>454</u>	
9	<u>256</u>		21	<u>515</u>	
10	<u>304</u>		22		
11	<u>311</u>		23		
12	<u>318</u>		24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle, add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 0525</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Main
 Personnel: KC, ST

Bottle 2 of 3
 Date/Time On-Site: 11/14/23 751

☐ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>23119-12</u> -WC
Approx Sample Volume (mL):	<u>14750</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 535</u>	<u>Success</u>	13	<u>701</u>	
2	<u>541</u>		14	<u>730</u>	
3	<u>547</u>		15	<u>744</u>	
4	<u>553</u>		16	<u>753</u>	
5	<u>559</u>		17	<u>759</u>	
6	<u>605</u>		18	<u>805</u>	
7	<u>610</u>		19	<u>810</u>	
8	<u>615</u>		20	<u>815</u>	
9	<u>620</u>		21	<u>820</u>	
10	<u>626</u>		22	<u>824</u>	
11	<u>634</u>		23	<u>828</u>	
12	<u>645</u>		24	<u>832</u>	

Comments:

If sampling is complete: ☐ Power off sampler ☐ Verify Flowmeter is running ☐ Add ice to sample transport cooler ☐ Complete COC form; arrange transport to lab	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning - Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Main
 Personnel: KCIST

Bottle 3 of 3
 Date/Time On-Site: 11/19/23 1020

☒ Halt Sampler program			
☒ Put lid on sample bottle; label sample bottle			
Sample ID:	<u>231119-12</u>	-WC	
Approx Sample Volume (mL):	<u>8750 mL</u>		
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>		
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Tan</u>		
QA/QC Sample ID:		-103	(Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 923</u>	<u>Success</u>	13	<u>1127</u>	<u>Success</u>
2	<u>928</u>		14	<u>1210</u>	
3	<u>934</u>		15	<u>1442</u>	
4	<u>940</u>		16		
5	<u>947</u>		17		
6	<u>955</u>		18		
7	<u>1004</u>		19		
8	<u>1013</u>		20		
9	<u>1023</u>		21		
10	<u>1034</u>		22		
11	<u>1047</u>		23		
12	<u>1103</u>		24		

Comments:

If sampling is complete: ☒ Power off sampler ☒ Verify flowmeter is running ☒ Add ice to sample transport cooler ☒ Complete COC form; arrange transport to lab	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Main

Personnel: ST, KC Date/Time On-Site: 11/19/2023 01:11

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1:11	3.67	140.41	0.91	12.6		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E. Coli</i>	231119-12-WG	~~11/19~~ 11/19/23	1:19	☒
Field Duplicate <i>E. Coli</i>	-101			☐
Field Blank <i>E. Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP11	1:22	10.54	9.48	7.64	174.43

Sampler Current Status	
First Subsample Date/Time	11/19/2023 1:07
Last Subsample Date/Time	11/19/2023 1:07
# of Subsamples taken	1

Comments:

Set Up/ Shut Down Form – ISCO

STATION: Americana

SET UP

Personnel: KC, ST

Date/Time

On-Site: 11/17/23 1537

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1541	5.43	-0.23	-0.291	11.78
Enable Condition:		6.96		
Hysteresis:		1		
Flow Pulse Interval:		KC 2910 cfs		

On-Site

- ☒ Replace flowmeter battery, install sampler battery.
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time directly on keypad 1541
- ☐ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 11/20 11:47

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
11:54	5.2	1.272	1.716	12.12
Downloaded to:		Stevens USB		

On-Site

- ☐ Replace flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 11/27 3:58 PM
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Didn't change settings back to dry weather till 11/27. Battery was dead and the last time that was read was 11/27 @ 00:02. -ST

Composite Sample Collection

STATION: Americana
 Personnel: _____

Bottle 1 of 4

Date/Time On-Site: _____

☒ Halt sampler program		
☒ Put lid on sample bottle; label sample bottle		
Sample ID:	<u>23119-14</u>	-WC
Approx Sample Volume (mL):	<u>11750 ml</u>	
Clarity (ex. Clear, Cloudy, Silty):	<u>cloudy</u>	
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Tan/yellow</u>	
QA/QC Sample ID:		-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>11/17/23 132</u>	<u>Success</u>	13	<u>320</u>	
2	<u>149</u>		14	<u>326</u>	
3	<u>204</u>		15	<u>332</u>	
4	<u>214</u>		16	<u>338</u>	
5	<u>223</u>		17	<u>344</u>	
6	<u>231</u>		18	<u>351</u>	
7	<u>239</u>		19	<u>357</u>	
8	<u>246</u>		20	<u>405</u>	
9	<u>254</u>		21		
10	<u>301</u>		22		
11	<u>307</u>		23		
12	<u>314</u>		24		

Comments:

If sampling is complete:

- ☐ Power off sampler, if separate from flowmeter
- ☐ Keep flowmeter running
- ☐ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle; add ice
- ☒ Restart program from beginning

Date/Time Restarted: 11/19/23 0411

- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Americana

Bottle 2 of 4

Personnel: _____

Date/Time On-Site: _____

☐ Halt Sampler program

☐ Put lid on sample bottle; label sample bottle

Sample ID:	23119-14-	-WC
Approx Sample Volume (mL):	13250	
Clarity (ex. Clear, Cloudy, Silty):	Silty	
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan	
QA/QC Sample ID:	-103	(Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	11/19/23 4:12	Success	13	6:08	
2	4:20		14	6:03	
3	4:25		15	6:08	
4	4:38		16	6:13	
5	4:49		17	6:17	
6	5:01		18	6:21	
7	5:13		19	6:26	
8	5:25		20	6:31	
9	5:33		21	6:36	
10	5:40		22	6:41	
11	5:41		23	6:48	
12	5:53		24	6:55	

Comments:

If sampling is complete:

- ☐ Power off sampler
- ☐ Verify flowmeter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: 08:05

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Amesbury
 Personnel: EC, ST

Bottle 3 of 4
 Date/Time On-Site: 11/19/23 1005

☒ Halt Sampler program
☐ Put lid on sample bottle; label sample bottle
Sample ID: <u>231119-14</u> -WC
Approx Sample Volume (mL): <u>13250 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 804</u>	<u>Success</u>	13	<u>857</u>	<u>Success</u>
2	<u>809</u>		14	<u>901</u>	
3	<u>814</u>		15	<u>905</u>	
4	<u>819</u>		16	<u>909</u>	
5	<u>823</u>		17	<u>913</u>	
6	<u>827</u>		18	<u>918</u>	
7	<u>832</u>		19	<u>922</u>	
8	<u>836</u>		20	<u>927</u>	
9	<u>840</u>		21	<u>932</u>	
10	<u>844</u>		22	<u>936</u>	
11	<u>848</u>		23	<u>941</u>	
12	<u>852</u>		24	<u>947</u>	

Comments:

If sampling is complete: ☐ Power off sampler ☐ Verify Flowmeter is running ☐ Add ice to sample transport cooler ☐ Complete COC form; arrange transport to lab	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 1010</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	<u>9.5"</u>	<u>13250 mL</u>	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

STATION: Americana
 Personnel: K.C. ST

Composite Sample Collection

Bottle 4 of 4
 Date/Time On-Site: 11/19/23 1141

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>23119-14</u> -WC
Approx Sample Volume (mL): <u>11750 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: <u>-103</u> (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	11/19/23 1014	Success	13	11/19/23 1147	Success
2	1020		14	1201	
3	1026		15	1215	
4	1032		16	1231	
5	1039		17	1300	
6	1045		18	1320	
7	1052		19	1342	
8	1100		20	1407	
9	1108		21		
10	1116		22		
11	1126		23		
12	1136		24		

Comments:

If sampling is complete:

- ☒ Power off sampler, if separate from flowmeter
- ☒ Keep flowmeter running
- ☒ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Amurina

Personnel: KC, ST Date/Time On-Site: 11/19/23 140

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
0145	7.28	2.99	2.462	12.00		

Grab Information					
	Sample ID		Date	Time	Labeled?
Site E.Coli	23119-14	-WG	11/19/23	153	☒
Field Duplicate E.Coli	23119-14	-101	11/19/23	156	☒
Field Blank E.Coli	23119-14	-001	11/19/23	159	☒

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP11	0151	14.16			

Sampler Current Status	
First Subsample Date/Time	11/19/23 0132
Last Subsample Date/Time	11/19/23 0132
# of Subsamples taken	1

Comments:

Field parameters (DO, pH, + cond) accidentally not recorded in field. *not*

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: AS_6

SET UP

Personnel: KL, ST

Date/Time 11/17/23 11:19
On-Site: 11/17/23 10:19

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1731	0.0	0.0	0.0	12.2
Enable Condition or Velocity Cutoff:			0.02	
Deadband:				
Trigger Volume:			221 cf	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☐ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

Sample volume set to 490ml due to calibration issues.

SHUT DOWN

Personnel: ST

Date/Time 11/20 11:03
On-Site: 11/20 11:03

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
11:11	0.0	0.0	0.0		12.8
Downloaded to:			Rugged 6		

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: AS-6
 Personnel: KC, ST

Bottle 1 of 4
 Date/Time On-Site: 11/19/23 6:13

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>231119-206</u> -WC
Approx Sample Volume (mL):	<u>13250 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Dark Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>11/19/23 3:14</u>		13	<u>540</u>	
2	<u>327</u>		14	<u>549</u>	
3	<u>340</u>		15	<u>556</u>	
4	<u>352</u>		16	<u>602</u>	
5	<u>403</u>		17	<u>608</u>	
6	<u>414</u>		18	<u>613</u>	
7	<u>425</u>		19	<u>618</u>	
8	<u>437</u>		20	<u>622</u>	
9	<u>450</u>		21	<u>626</u>	
10	<u>503</u>		22	<u>630</u>	
11	<u>517</u>		23	<u>634</u>	
12	<u>529</u>		24	<u>637</u>	

Comments:

Here at 2:20 but not enough flow for Grab Sample.

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle, add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 6:42</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: AS-6
 Personnel: ST. ICC

Bottle 2 of 4
 Date/Time On-Site: 11/19/23 8:10

☐ Halt Sampler program
☐ Put lid on sample bottle; label sample bottle
Sample ID: <u>2311A-206</u> -WC
Approx Sample Volume (mL): <u>17750</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	11/19/23 6:44	Success	13		
2	6:50	Dist. error	14		
3	6:58	Success	15		
4	7:03	Success	16		
5	7:08		17		
6	7:13		18		
7	7:19		19		
8	7:25		20		
9	7:33		21		
10	7:40	Dist. error	22		
11			23		
12			24		

Comments: Bottle completely full + water in tubing.
 Battery was dead. Replaced battery + restarted

If sampling is complete: ☐ Power off sampler ☐ Verify flowmeter is running ☐ Add ice to sample transport cooler ☐ Complete COC form; arrange transport to lab	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>11/19/23 8:26</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

STATION: AS-6
 Personnel: VC, ST

Composite Sample Collection

Bottle 3 of 4

Date/Time On-Site: _____

☒ Halt Sampler program		
☐ Put lid on sample bottle; label sample bottle		
Sample ID:	<u>231119-206</u>	-WC
Approx Sample Volume (mL):	<u>12500</u>	
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>	
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>	
QA/QC Sample ID:	-103	(Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>11/19/23 821</u>		13	<u>910</u>	
2	<u>826</u>		14	<u>914</u>	
3	<u>831</u>		15	<u>918</u>	
4	<u>836</u>		16	<u>922</u>	
5	<u>841</u>		17	<u>926</u>	
6	<u>845</u>		18	<u>929</u>	
7	<u>849</u>		19	<u>933</u>	
8	<u>852</u>		20	<u>936</u>	
9	<u>856</u>		21	<u>938</u>	
10	<u>859</u>		22	<u>941</u>	
11	<u>903</u>		23	<u>943</u>	
12	<u>907</u>		24	<u>946</u>	

Comments:

If sampling is complete:

- ☐ Power off sampler
- ☐ Verify Flowmeter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: AS-6
 Personnel: KC, ST

Bottle 9 of 4
 Date/Time On-Site: 11/19/23 1150

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	11,000
Clarity (ex. Clear, Cloudy, Silty):	Cloudy
Color (ex. Clear, Gray, Tan, Brown, Black):	Brown
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	11/19/23 953	No liquid err	13	1049	Success
2	957	Success	14	1054	
3	1001		15	1101	
4	1006		16	1107	
5	1010		17	1114	
6	1014		18	1121	
7	1019		19	1128	
8	1024		20	1136	
9	1029		21	1146	
10	1034		22	1156	
11	1038		23	1208	
12	1043		24	1221	

Comments:

If sampling is complete:

- ☒ Power off sampler, if separate from flowmeter
- ☒ Keep flowmeter running
- ☒ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: AS-6

Personnel: KC, ST Date/Time On-Site: 11/19/23 0613

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
622	5.794	0.90	1.62	11.7		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E.Coli</i>	231119-206 -WG	11/19/23	622	☐
Field Duplicate <i>E.Coli</i>	-101			☐
Field Blank <i>E.Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

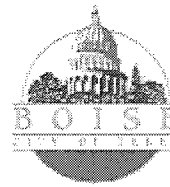
Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP11	620	9.04	9.44	7.18	184.28

Sampler Current Status	
First Subsample Date/Time	11/19/2023 314
Last Subsample Date/Time	11/19/2023 622
# of Subsamples taken	20

Comments:

Attachment D: Storm Event Analytical Reports

Report Date: 12/08/2023 12:41



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00323-01	ACST1B	231119-03-WG	Water		11/19/2023	11/19/2023
AC00323-02	ACST1B	231119-11-WG	Water		11/19/2023	11/19/2023
AC00323-03	ACST1B	231119-12-WG	Water		11/19/2023	11/19/2023
AC00323-04	ACST1B	231119-14-WG	Water		11/19/2023	11/19/2023
AC00323-05	ACST1B	231119-14-101	Water		11/19/2023	11/19/2023
AC00323-06	ACST1B	231119-14-001	Water		11/19/2023	11/19/2023

Report Date: 12/08/2023 12:41



Boise City Public Works
Water Quality Laboratory
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Analysis Report

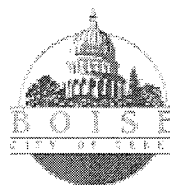
Location: ACST1B
Date/Time Collected: 11/19/2023 01:38
Lab Number: AC00323-01
Sample Type: Grab

Location Description: 231119-03-WG
Sample Collector: GK
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Microbiology										
E. Coli	B234656	2.0 MPN/100 mL		1.0	1.0	IDEXX - Colilert	11/19/23 08:58	11/20/23 9:22	SMC	
Wet Chemistry										
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod	11/19/23	11/19/23 8:36	ASE	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/08/2023 12:41



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 11/19/2023 02:39
Lab Number: AC00323-02
Sample Type: Grab

Location Description: 231119-11-WG
Sample Collector: GK
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst		
				MDL *	MDL				Reference	Initials	Qualifier
Microbiology											
E. Coli	B234656	99.0 MPN/100 mL		1.0	1.0	IDEXX - Colilert	11/19/23 08:58	11/20/23 9:22	SMC		
Wet Chemistry											
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod	11/19/23	11/19/23 8:36	ASE		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/08/2023 12:41



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Boise, Idaho 83714-1076
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Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 11/19/2023 01:19
Lab Number: AC00323-03
Sample Type: Grab

Location Description: 231119-12-WG
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst	
				MDL *	MDL				Reference	Initials
Microbiology										
E. Coli	B234656	30.9MPN/100 mL		1.0	1.0	IDEXX - Colilert	11/19/23 08:58	11/20/23 9:22	SMC	
Wet Chemistry										
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod	11/19/23	11/19/23 8:36	ASE	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/08/2023 12:41



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Analysis Report

Location: ACST1B
Date/Time Collected: 11/19/2023 01:53
Lab Number: AC00323-04
Sample Type: Grab

Location Description: 231119-14-WG
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst		
				MDL *	MDL				Reference	Initials	Qualifier
Microbiology											
E. Coli	B234656	1340.0 MPN/100 mL		100.0	1.0	IDEXX - Colilert	11/19/23 08:58	11/20/23 9:22	SMC	D	
Wet Chemistry											
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod	11/19/23	11/19/23 8:36	ASE		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/08/2023 12:41



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 11/19/2023 12:00
Lab Number: AC00323-05
Sample Type: Grab

Location Description: 231119-14-101
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Microbiology										
E. Coli	B234656	866.4 MPN/100 mL		1.0	1.0	IDEXX - Colilert	11/19/23 08:58	11/20/23 9:22	SMC	
Wet Chemistry										
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod	11/19/23	11/19/23 8:36	ASE	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/08/2023 12:41



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

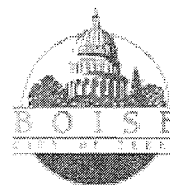
Location: ACST1B
Date/Time Collected: 11/19/2023 12:00
Lab Number: AC00323-06
Sample Type: Grab

Location Description: 231119-14-001
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst		
				MDL *	MDL				Reference	Initials	Qualifier
Microbiology											
E. Coli	B234656	<1.0 MPN/100 mL		1.0	1.0	IDEXX - Colilert	11/19/23 08:58	11/20/23 9:22	SMC	U	
Wet Chemistry											
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod	11/19/23	11/19/23 8:36	ASE		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/08/2023 12:41



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier

Microbiology

Batch: B234656

Blank (B234656-BLK1)

E. Coli	Absent						11/20/2023	SMC	

LCS (B234656-BS1)

E. Coli				Present			11/20/2023	SMC	

Duplicate (B234656-DUP2) Source ID: AC00323-04RE1

E. Coli					Pass	128	11/20/2023	SMC	



Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418

Tel. (208) 387-6269

Fax (208) 387-6391

Purchase Order:

63065628

Project:

Stormwater-PI

Sampler(s):

Steven Turner

Kristen Chisholm

Hannah Johnson

Gabriella Kanoa

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix		Type	Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 361.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ - D	Total Containers
							Water	Grab																		
AC00323	11/19/23		0138		231119-03-WG	GR	X	X												X						1
-01			0239		231119-11-WG	GR	X	X												X						1
-02			0119		231119-12-WG	ST	X	X												X						1
-03			0153		231119-14-WG	ST	X	X												X						1
-04			1200		231119-14-101	ST	X	X												X						1
-05			1200		231119-14-001	ST	X	X												X						1
-06																										

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Hannah Johnson	4:04 11/19/23	ASE	Received samples 11-19-23 0758

Report Date: 12/20/2023 13:21



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00324-01	ACST1B	231119-206-WG	Water		11/19/2023	11/19/2023
AC00324-02	ACST1C	231119-206-WC	Water		11/19/2023	11/19/2023
AC00324-03	ACST1C	231119-03-WC	Water		11/19/2023	11/19/2023
AC00324-04	ACST1C	231119-11-WC	Water		11/19/2023	11/19/2023
AC00324-05	ACST1C	231119-12-WC	Water		11/19/2023	11/19/2023
AC00324-06	ACST1C	231119-14-WC	Water		11/19/2023	11/19/2023

Report Date: 12/20/2023 13:21



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Analysis Report

Location:	ACST1B	Location Description:	231119-206-WG
Date/Time Collected:	11/19/2023 06:22		
Lab Number:	AC00324-01	Sample Collector:	S.T
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL					Initials	Qualifier
Microbiology											
E. Coli	B234656	1732.9MPN/100 mL		1.0	1.0	IDEXX - Colilert		11/19/23 13:58	11/20/23 13:59	SMC	
Net Chemistry											
Chlorine Screen	B234655	Absent				SM 4500-CL G-2000 mod		11/19/23	11/20/23 13:52	ASE	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 12/20/2023 13:21



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Boise, Idaho 83714-1076
Telephone (208) 608-7240
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Analysis Report

Location: ACST1C
Date/Time Collected: 11/19/2023 03:14 - 11/19/2023 12:21
Lab Number: AC00324-02
Sample Type: Composite

Location Description: 231119-206-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B234817	0.563	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	12/01/23	12/1/23 13:36	JAL	
BOD5	B234673	162	mg/L	2.00	2.00	SM 5210 B-2016	11/20/23	11/25/23 13:42	MEC	
COD	B234668	329	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/20/23	11/20/23 12:29	BAK	
Nitrate-Nitrite, as N	B234773	0.136	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/29/23	11/29/23 13:43	JAL	
TKN	B234964	3.17	mg/L	0.800	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	12/15/23	12/15/23 10:46	JAL	D
Total Dissolved Solids	B234678	263	mg/L	20.0	20.0	SM 2540 C-2015	11/20/23	11/22/23 9:26	RKT	
Total Suspended Solids	B234665	28.7	mg/L	0.900	0.900	SM 2540 D-2015	11/20/23	11/20/23 12:06	NTS	
Turbidity	B234675	21.1	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/20/23	11/20/23 13:00	JAL	
Dissolved Wet Chemistry										
Orthophosphate, as P	B234672	1.71	mg/L	0.0300	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/20/23	11/20/23 11:43	JAL	D
Total Metals										
Mercury	B234760	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	11/29/23	11/30/23 9:22	SAS	U
Arsenic	B234724	1.7	ug/L	0.070	0.070	EPA 200.8	11/25/23	11/26/23 14:05	DMW	
Cadmium	B234724	0.059	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:05	DMW	
Calcium	B234692	11.8	mg/L	0.0400	0.0400	EPA 200.7	11/21/23	11/22/23 17:43	EDM	
Lead	B234724	3.3	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:05	DMW	
Magnesium	B234692	3370	ug/L	80.0	80.0	EPA 200.7	11/21/23	11/22/23 17:43	EDM	
Phosphorus as P	B234692	2.06	mg/L	0.0120	0.0120	EPA 200.7	11/21/23	11/22/23 17:43	EDM	
Hardness	B234692	43.3	mg/L	0.100	0.100	SM 2340 B-2011	11/21/23	11/22/23 17:43	EDM	
Dissolved Metals										
Cadmium	B234723	0.029	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/25/23 16:25	DMW	
Copper	B234723	8.5	ug/L	0.15	0.15	EPA 200.8	11/25/23	11/25/23 16:25	DMW	
Lead	B234723	0.93	ug/L	9.00E-3	9.00E-3	EPA 200.8	11/25/23	11/25/23 16:25	DMW	
Zinc	B234723	61.8	ug/L	0.50	0.50	EPA 200.8	11/25/23	11/25/23 16:25	DMW	

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Report Date: 12/20/2023 13:21



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Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1C	Location Description:	231119-03-WC
Date/Time Collected:	11/19/2023 02:16 - 11/19/2023 13:28		
Lab Number:	AC00324-03	Sample Collector:	S.T
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B234817	0.530	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	12/01/23	12/1/23 13:41	JAL	
BOD5	B234673	59.5	mg/L	2.00	2.00	SM 5210 B-2016	11/20/23	11/25/23 13:24	MEC	
COD	B234668	137	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/20/23	11/20/23 12:29	BAK	
Nitrate-Nitrite, as N	B234773	0.145	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/29/23	11/29/23 13:44	JAL	
TKN	B234779	1.76	mg/L	0.200	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	11/30/23	12/1/23 10:11	ALN	
Total Dissolved Solids	B234678	136	mg/L	20.0	20.0	SM 2540 C-2015	11/20/23	11/22/23 9:28	RKT	
Total Suspended Solids	B234665	8.63	mg/L	0.900	0.900	SM 2540 D-2015	11/20/23	11/20/23 10:04	NTS	
Turbidity	B234675	8.6	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/20/23	11/20/23 13:04	JAL	
Dissolved Wet Chemistry										
Orthophosphate, as P	B234672	0.538	mg/L	0.0150	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/20/23	11/20/23 11:45	JAL	D
Total Metals										
Mercury	B234760	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	11/29/23	11/30/23 9:08	SAS	U
Arsenic	B234724	0.93	ug/L	0.070	0.070	EPA 200.8	11/25/23	11/26/23 14:15	DMW	
Cadmium	B234724	0.030	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:15	DMW	
Calcium	B234692	8.66	mg/L	0.0400	0.0400	EPA 200.7	11/21/23	11/22/23 17:38	EDM	
Lead	B234724	0.33	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:15	DMW	
Magnesium	B234692	3430	ug/L	80.0	80.0	EPA 200.7	11/21/23	11/22/23 17:38	EDM	
Phosphorus as P	B234692	0.710	mg/L	0.0120	0.0120	EPA 200.7	11/21/23	11/22/23 17:38	EDM	
Hardness	B234692	35.8	mg/L	0.100	0.100	SM 2340 B-2011	11/21/23	11/22/23 17:38	EDM	
Dissolved Metals										
Cadmium	B234723	0.012	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/25/23 16:35	DMW	
Copper	B234723	3.5	ug/L	0.15	0.15	EPA 200.8	11/25/23	11/25/23 16:35	DMW	
Lead	B234723	0.085	ug/L	9.00E-3	9.00E-3	EPA 200.8	11/25/23	11/25/23 16:35	DMW	
Zinc	B234723	32.7	ug/L	0.50	0.50	EPA 200.8	11/25/23	11/25/23 16:35	DMW	

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Report Date: 12/20/2023 13:21



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
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Analysis Report

Location: ACST1C
Date/Time Collected: 11/19/2023 02:24 - 11/19/2023 15:28
Lab Number: AC00324-04
Sample Type: Composite

Location Description: 231119-11-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B234817	0.527	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	12/01/23	12/1/23 13:53	JAL	
BOD5	B234673	61.9	mg/L	2.00	2.00	SM 5210 B-2016	11/20/23	11/25/23 13:17	MEC	
COD	B234668	167	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/20/23	11/20/23 12:29	BAK	
Nitrate-Nitrite, as N	B234773	0.182	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/29/23	11/29/23 13:45	JAL	
TKN	B234779	2.07	mg/L	0.200	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	11/30/23	12/1/23 10:12	ALN	
Total Dissolved Solids	B234678	180	mg/L	20.0	20.0	SM 2540 C-2015	11/20/23	11/22/23 9:29	RKT	
Total Suspended Solids	B234665	27.3	mg/L	0.900	0.900	SM 2540 D-2015	11/20/23	11/20/23 11:05	NTS	
Turbidity	B234675	19.7	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/20/23	11/20/23 13:15	JAL	
Dissolved Wet Chemistry										
Orthophosphate, as P	B234672	0.768	mg/L	0.0150	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/20/23	11/20/23 11:46	JAL	D
Total Metals										
Mercury	B234760	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	11/29/23	11/30/23 9:25	SAS	U
Arsenic	B234724	1.7	ug/L	0.070	0.070	EPA 200.8	11/25/23	11/26/23 14:17	DMW	
Cadmium	B234724	0.041	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:17	DMW	
Calcium	B234692	13.3	mg/L	0.0400	0.0400	EPA 200.7	11/21/23	11/22/23 17:40	EDM	
Lead	B234724	2.2	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:17	DMW	
Magnesium	B234692	2850	ug/L	80.0	80.0	EPA 200.7	11/21/23	11/22/23 17:40	EDM	
Phosphorus as P	B234692	0.958	mg/L	0.0120	0.0120	EPA 200.7	11/21/23	11/22/23 17:40	EDM	
Hardness	B234692	45.0	mg/L	0.100	0.100	SM 2340 B-2011	11/21/23	11/22/23 17:40	EDM	
Dissolved Metals										
Cadmium	B234723	<0.0100	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/25/23 16:37	DMW	U
Copper	B234723	5.0	ug/L	0.15	0.15	EPA 200.8	11/25/23	11/25/23 16:37	DMW	
Lead	B234723	0.21	ug/L	9.00E-3	9.00E-3	EPA 200.8	11/25/23	11/25/23 16:37	DMW	
Zinc	B234723	32.3	ug/L	0.50	0.50	EPA 200.8	11/25/23	11/25/23 16:37	DMW	

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Report Date: 12/20/2023 13:21



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Boise, Idaho 83714-1076
Telephone (208) 608-7240
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Analysis Report

Location:	ACST1C	Location Description:	231119-12-WC
Date/Time Collected:	11/19/2023 01:07 - 11/19/2023 14:42		
Lab Number:	AC00324-05	Sample Collector:	S.T
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B234817	0.610	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	12/01/23	12/1/23 13:49	JAL	
BOD5	B234673	19.9	mg/L	2.00	2.00	SM 5210 B-2016	11/20/23	11/25/23 13:10	MEC	
COD	B234668	61.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/20/23	11/20/23 12:29	BAK	
Nitrate-Nitrite, as N	B234773	0.246	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/29/23	11/29/23 13:46	JAL	
TKN	B234779	1.14	mg/L	0.200	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	11/30/23	12/1/23 10:14	ALN	
Total Dissolved Solids	B234678	61.0	mg/L	20.0	20.0	SM 2540 C-2015	11/20/23	11/22/23 9:30	RKT	
Total Suspended Solids	B234665	16.2	mg/L	0.900	0.900	SM 2540 D-2015	11/20/23	11/20/23 11:04	NTS	
Turbidity	B234675	11.7	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/20/23	11/20/23 13:12	JAL	

Dissolved Wet Chemistry										
Orthophosphate, as P	B234672	0.167	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/20/23	11/20/23 11:33	JAL	

Total Metals										
Mercury	B234760	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	11/29/23	11/30/23 9:36	SAS	U
Arsenic	B234724	0.66	ug/L	0.070	0.070	EPA 200.8	11/25/23	11/26/23 14:20	DMW	
Cadmium	B234724	0.045	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:20	DMW	
Calcium	B234692	5.87	mg/L	0.0400	0.0400	EPA 200.7	11/21/23	11/22/23 17:22	EDM	
Lead	B234724	1.7	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:20	DMW	
Magnesium	B234692	1120	ug/L	80.0	80.0	EPA 200.7	11/21/23	11/22/23 17:22	EDM	
Phosphorus as P	B234692	0.226	mg/L	0.0120	0.0120	EPA 200.7	11/21/23	11/22/23 17:22	EDM	
Hardness	B234692	19.3	mg/L	0.100	0.100	SM 2340 B-2011	11/21/23	11/22/23 17:22	EDM	

Dissolved Metals										
Cadmium	B234723	0.015	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/25/23 16:39	DMW	
Copper	B234723	2.7	ug/L	0.15	0.15	EPA 200.8	11/25/23	11/25/23 16:39	DMW	
Lead	B234723	0.12	ug/L	9.00E-3	9.00E-3	EPA 200.8	11/25/23	11/25/23 16:39	DMW	
Zinc	B234723	25.9	ug/L	0.50	0.50	EPA 200.8	11/25/23	11/25/23 16:39	DMW	

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Report Date: 12/20/2023 13:21



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11818 Joplin Road
Boise, Idaho 83714-1076
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Fax (208) 608-7319

Analysis Report

Location: ACST1C
Date/Time Collected: 11/19/2023 01:32 - 11/19/2023 14:07
Lab Number: AC00324-06
Sample Type: Composite

Location Description: 231119-14-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B234817	0.454	mg/L	0.0350	0.0350	SM 4500-NH3 D-2011	12/01/23	12/1/23 13:45	JAL	
BOD5	B234673	36.5	mg/L	2.00	2.00	SM 5210 B-2016	11/20/23	11/25/23 13:06	MEC	
COD	B234668	94.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	11/20/23	11/20/23 12:29	BAK	
Nitrate-Nitrite, as N	B234773	0.614	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	11/29/23	11/29/23 13:47	JAL	
TKN	B234779	1.27	mg/L	0.200	0.200	EPA 351.2, 10-107-06-2-M (Equivalent)	11/30/23	12/1/23 10:15	ALN	
Total Dissolved Solids	B234678	153	mg/L	20.0	20.0	SM 2540 C-2015	11/21/23	11/22/23 9:31	RKT	
Total Suspended Solids	B234665	21.7	mg/L	0.900	0.900	SM 2540 D-2015	11/20/23	11/20/23 10:03	NTS	
Turbidity	B234675	15.0	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	11/20/23	11/20/23 13:07	JAL	
Dissolved Wet Chemistry										
Orthophosphate, as P	B234672	0.402	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	11/20/23	11/20/23 11:37	JAL	
Total Metals										
Mercury	B234760	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	11/29/23	11/30/23 9:39	SAS	U
Arsenic	B234724	2.1	ug/L	0.070	0.070	EPA 200.8	11/25/23	11/26/23 14:22	DMW	
Cadmium	B234724	0.061	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:22	DMW	
Calcium	B234692	17.4	mg/L	0.0400	0.0400	EPA 200.7	11/21/23	11/22/23 17:24	EDM	
Lead	B234724	1.9	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/26/23 14:22	DMW	
Magnesium	B234692	3490	ug/L	80.0	80.0	EPA 200.7	11/21/23	11/22/23 17:24	EDM	
Phosphorus as P	B234692	0.504	mg/L	0.0120	0.0120	EPA 200.7	11/21/23	11/22/23 17:24	EDM	
Hardness	B234692	57.8	mg/L	0.100	0.100	SM 2340 B-2011	11/21/23	11/22/23 17:24	EDM	
Dissolved Metals										
Cadmium	B234723	0.022	ug/L	0.010	0.010	EPA 200.8	11/25/23	11/25/23 16:42	DMW	
Copper	B234723	4.0	ug/L	0.15	0.15	EPA 200.8	11/25/23	11/25/23 16:42	DMW	
Lead	B234723	0.11	ug/L	9.00E-3	9.00E-3	EPA 200.8	11/25/23	11/25/23 16:42	DMW	
Zinc	B234723	27.2	ug/L	0.50	0.50	EPA 200.8	11/25/23	11/25/23 16:42	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B234656									
Blank (B234656-BLK1)									
E. Coli	Absent						11/20/2023	SMC	
LCS (B234656-BS1)									
E. Coli				Present			11/20/2023	SMC	
Duplicate (B234656-DUP2) Source ID: AC00323-04RE1									
E. Coli					Pass	128	11/20/2023	SMC	
Met Chemistry									
Batch: B234665									
Blank (B234665-BLK1)									
Total Suspended Solids	<0.9	mg/L					11/20/2023	NTS	U
LCS (B234665-BS1)									
Total Suspended Solids			97.5	90-110			11/20/2023	NTS	
Duplicate (B234665-DUP1) Source ID: WB02817-07									
Total Suspended Solids					3.88	20	11/20/2023	NTS	
Duplicate (B234665-DUP2) Source ID: LS01764-02									
Total Suspended Solids					3.33	20	11/20/2023	NTS	
Batch: B234668									
Blank (B234668-BLK1)									
COD	<7	mg/L					11/20/2023	BAK	U
LCS (B234668-BS1)									
COD			101	90-110			11/20/2023	BAK	
Duplicate (B234668-DUP1) Source ID: AC00324-02									
COD					0.304	10	11/20/2023	BAK	
Batch: B234673									
Blank (B234673-BLK1)									
BOD5	<2	mg/L					11/25/2023	MEC	U
LCS (B234673-BS2)									
BOD5			110	84.6-115.4			11/25/2023	MEC	
Duplicate (B234673-DUP1) Source ID: ST00061-02									
BOD5					1.13	30	11/25/2023	MEC	D
Duplicate (B234673-DUP2) Source ID: AC00324-03									
BOD5					3.79	30	11/25/2023	MEC	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B234675									
Blank (B234675-BLK1)									
Turbidity	<0.3	NTU					11/20/2023	JAL	U
LCS (B234675-BS1)									
Turbidity			97.9	90-110			11/20/2023	JAL	
Duplicate (B234675-DUP1) Source ID: AC00324-06									
Turbidity					5.41	25	11/20/2023	JAL	
Batch: B234678									
Blank (B234678-BLK1)									
Total Dissolved Solids	<20	mg/L					11/22/2023	RKT	U
LCS (B234678-BS1)									
Total Dissolved Solids			95.5	90-110			11/22/2023	RKT	
Duplicate (B234678-DUP1) Source ID: AC00324-02									
Total Dissolved Solids					0.286	10	11/22/2023	RKT	
Batch: B234773									
Blank (B234773-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					11/29/2023	JAL	U
Blank (B234773-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					11/29/2023	JAL	U
LCS (B234773-BS1)									
Nitrate-Nitrite, as N			98.7	90-110			11/29/2023	JAL	
LCS (B234773-BS2)									
Nitrate-Nitrite, as N			98.8	90-110			11/29/2023	JAL	
Duplicate (B234773-DUP1) Source ID: BB03404-02									
Nitrate-Nitrite, as N					8.87	10	11/29/2023	JAL	
Duplicate (B234773-DUP2) Source ID: RW00047-01									
Nitrate-Nitrite, as N					0.228	10	11/29/2023	JAL	
Duplicate (B234773-DUP3) Source ID: WB02832-06									
Nitrate-Nitrite, as N					0.449	10	11/29/2023	JAL	
Matrix Spike (B234773-MS1) Source ID: BB03404-02									
Nitrate-Nitrite, as N			100	90-110			11/29/2023	JAL	
Matrix Spike (B234773-MS2) Source ID: RW00047-01									
Nitrate-Nitrite, as N			97.9	90-110			11/29/2023	JAL	
Matrix Spike (B234773-MS3) Source ID: WB02832-06									
Nitrate-Nitrite, as N			103	90-110			11/29/2023	JAL	
Matrix Spike Dup (B234773-MSD1) Source ID: BB03404-02									
Nitrate-Nitrite, as N			101	90-110	0.293	10	11/29/2023	JAL	
Matrix Spike Dup (B234773-MSD2) Source ID: RW00047-01									
Nitrate-Nitrite, as N			97.8	90-110	0.0212	10	11/29/2023	JAL	
Matrix Spike Dup (B234773-MSD3) Source ID: WB02832-06									
Nitrate-Nitrite, as N			104	90-110	0.135	10	11/29/2023	JAL	

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Quality Control Report
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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Met Chemistry (Continued)									
Batch: B234779									
Blank (B234779-BLK1) TKN	<0.2	mg/L					12/01/2023	ALN	U
Blank (B234779-BLK2) TKN	<0.2	mg/L					12/01/2023	ALN	U
LCS (B234779-BS1) TKN			100	80-120			12/01/2023	ALN	
LCS (B234779-BS2) TKN			99.5	80-120			12/01/2023	ALN	
Duplicate (B234779-DUP2) TKN	Source ID: BB03404-01				2.65	20	12/01/2023	ALN	D
Duplicate (B234779-DUP3) TKN	Source ID: LS01768-02				3.57	20	12/01/2023	ALN	D
Duplicate (B234779-DUP4) TKN	Source ID: RW00047-02				2.40	20	12/01/2023	ALN	D
Matrix Spike (B234779-MS2) TKN	Source ID: BB03404-01		95.4	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS3) TKN	Source ID: LS01768-02		102	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS4) TKN	Source ID: RW00047-02		105	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS5) TKN	Source ID: EP00286-01		81.5	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS6) TKN	Source ID: EP00287-01		101	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS7) TKN	Source ID: EP00288-01		97.9	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS8) TKN	Source ID: EP00289-01		105	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MS9) TKN	Source ID: EP00290-01		99.1	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MSA) TKN	Source ID: EP00291-01		102	80-120			12/01/2023	ALN	D
Matrix Spike (B234779-MSC) TKN	Source ID: EP00294-01		104	80-120			12/01/2023	ALN	D
Matrix Spike Dup (B234779-MSD2) TKN	Source ID: BB03404-01		98.0	80-120	1.43	20	12/01/2023	ALN	D
Matrix Spike Dup (B234779-MSD3) TKN	Source ID: LS01768-02		102	80-120	0.104	20	12/01/2023	ALN	D
Matrix Spike Dup (B234779-MSD4) TKN	Source ID: RW00047-02		108	80-120	1.54	20	12/01/2023	ALN	D

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Quality Control Report

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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B234817									
Blank (B234817-BLK1)									
Ammonia, as N	<0.035	mg/L					12/01/2023	JAL	U
LCS (B234817-BS1)									
Ammonia, as N			110	90-110			12/01/2023	JAL	
Duplicate (B234817-DUP1) Source ID: BB03379-02									
Ammonia, as N					0.316	10	12/01/2023	JAL	
Duplicate (B234817-DUP2) Source ID: BB03389-01									
Ammonia, as N					0.892	10	12/01/2023	JAL	
Matrix Spike (B234817-MS1) Source ID: BB03379-02									
Ammonia, as N			105	80-120			12/01/2023	JAL	
Matrix Spike (B234817-MS2) Source ID: BB03389-01									
Ammonia, as N			102	80-120			12/01/2023	JAL	
Matrix Spike Dup (B234817-MSD1) Source ID: BB03379-02									
Ammonia, as N			105	80-120	0.156	10	12/01/2023	JAL	
Matrix Spike Dup (B234817-MSD2) Source ID: BB03389-01									
Ammonia, as N			104	80-120	1.30	10	12/01/2023	JAL	
Batch: B234948									
Blank (B234948-BLK1)									
TKN	<0.2	mg/L					12/13/2023	EDM	U
LCS (B234948-BS1)									
TKN			100	80-120			12/13/2023	EDM	
Duplicate (B234948-DUP1) Source ID: BB03406-01									
TKN					1.18	20	12/13/2023	EDM	D
Duplicate (B234948-DUP2) Source ID: BB03408-01									
TKN					0.505	20	12/13/2023	EDM	D
Matrix Spike (B234948-MS1) Source ID: BB03406-01									
TKN			96.3	80-120			12/13/2023	EDM	D
Matrix Spike (B234948-MS2) Source ID: BB03408-01									
TKN			105	80-120			12/13/2023	EDM	D
Matrix Spike (B234948-MS4) Source ID: EP00293-01RE1									
TKN			99.4	80-120			12/13/2023	EDM	D
Matrix Spike (B234948-MS5) Source ID: EP00295-01									
TKN			103	80-120			12/13/2023	EDM	D
Matrix Spike Dup (B234948-MSD1) Source ID: BB03406-01									
TKN			92.3	80-120	1.14	20	12/13/2023	EDM	D
Matrix Spike Dup (B234948-MSD2) Source ID: BB03408-01									
TKN			104	80-120	0.586	20	12/13/2023	EDM	D



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Quality Control Report

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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Vet Chemistry (Continued)									
Batch: B234964									
Blank (B234964-BLK1)									
TKN	<0.2	mg/L					12/15/2023	JAL	U
LCS (B234964-BS1)									
TKN			93.6	80-120			12/15/2023	JAL	
Duplicate (B234964-DUP2) Source ID: BB03420-03									
TKN					4.44	20	12/15/2023	JAL	D
Duplicate (B234964-DUP3) Source ID: AC00324-02RE2									
TKN					15.8	20	12/15/2023	JAL	D
Matrix Spike (B234964-MS2) Source ID: BB03420-03									
TKN			98.0	80-120			12/15/2023	JAL	D
Matrix Spike (B234964-MS3) Source ID: AC00324-02RE2									
TKN			95.8	80-120			12/15/2023	JAL	D
Matrix Spike Dup (B234964-MSD2) Source ID: BB03420-03									
TKN			106	80-120	3.42	20	12/15/2023	JAL	D
Matrix Spike Dup (B234964-MSD3) Source ID: AC00324-02RE2									
TKN			110	80-120	11.9	20	12/15/2023	JAL	D

Dissolved Wet Chemistry

Batch: B234672									
Blank (B234672-BLK1)									
Orthophosphate, as P	<0.003	mg/L					11/20/2023	JAL	U
LCS (B234672-BS1)									
Orthophosphate, as P			95.7	90-110			11/20/2023	JAL	
Duplicate (B234672-DUP1) Source ID: AC00324-05									
Orthophosphate, as P					0.720	10	11/20/2023	JAL	
Matrix Spike (B234672-MS1) Source ID: AC00324-05									
Orthophosphate, as P			99.0	90-110			11/20/2023	JAL	
Matrix Spike Dup (B234672-MSD1) Source ID: AC00324-05									
Orthophosphate, as P			99.7	90-110	0.267	10	11/20/2023	JAL	

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Quality Control Report

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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B234692									
Blank (B234692-BLK1)									
Calcium	<0.04	mg/L					11/22/2023	EDM	U
Magnesium	<80	ug/L					11/22/2023	EDM	U
Phosphorus as P	<0.012	mg/L					11/22/2023	EDM	U
LCS (B234692-BS1)									
Calcium			100	85-115			11/22/2023	EDM	
Magnesium			99.6	85-115			11/22/2023	EDM	
Phosphorus as P			98.6	85-115			11/22/2023	EDM	
Duplicate (B234692-DUP1) Source ID: AC00324-06									
Calcium					0.0422	20	11/22/2023	EDM	
Magnesium					0.465	20	11/22/2023	EDM	
Phosphorus as P					0.357	20	11/22/2023	EDM	
Matrix Spike (B234692-MS1) Source ID: AC00324-06									
Calcium			100	70-130			11/22/2023	EDM	
Magnesium			101	70-130			11/22/2023	EDM	
Phosphorus as P			99.0	70-130			11/22/2023	EDM	
Matrix Spike Dup (B234692-MSD1) Source ID: AC00324-06									
Calcium			99.9	70-130	0.151	20	11/22/2023	EDM	
Magnesium			100	70-130	0.422	20	11/22/2023	EDM	
Phosphorus as P			99.3	70-130	0.191	20	11/22/2023	EDM	
Batch: B234724									
Blank (B234724-BLK1)									
Arsenic	<0.070	ug/L					11/26/2023	DMW	U
Cadmium	<0.010	ug/L					11/26/2023	DMW	U
Lead	<0.010	ug/L					11/26/2023	DMW	U
LCS (B234724-BS1)									
Arsenic			96.0	85-115			11/26/2023	DMW	
Cadmium			99.8	85-115			11/26/2023	DMW	
Lead			99.9	85-115			11/26/2023	DMW	
Duplicate (B234724-DUP1) Source ID: AC00324-02									
Arsenic					3.50	20	11/26/2023	DMW	
Cadmium					13.9	20	11/26/2023	DMW	
Lead					1.94	20	11/26/2023	DMW	
Matrix Spike (B234724-MS1) Source ID: AC00324-02									
Arsenic			96.2	70-130			11/26/2023	DMW	
Cadmium			99.4	70-130			11/26/2023	DMW	
Lead			95.5	70-130			11/26/2023	DMW	
Matrix Spike Dup (B234724-MSD1) Source ID: AC00324-02									
Arsenic			99.6	70-130	2.94	20	11/26/2023	DMW	
Cadmium			102	70-130	2.75	20	11/26/2023	DMW	
Lead			97.1	70-130	1.27	20	11/26/2023	DMW	

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Quality Control Report
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Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B234760									
Blank (B234760-BLK1)									
Mercury	<0.01	ug/L					11/30/2023	SAS	U
LCS (B234760-BS1)									
Mercury			98.9	85-115			11/30/2023	SAS	
Duplicate (B234760-DUP1) Source ID: AC00324-03									
Mercury					NR	20	11/30/2023	SAS	U
Duplicate (B234760-DUP2) Source ID: EP00285-01									
Mercury					NR	20	11/30/2023	SAS	U
Matrix Spike (B234760-MS1) Source ID: AC00324-03									
Mercury			103	70-130			11/30/2023	SAS	
Matrix Spike (B234760-MS2) Source ID: EP00285-01									
Mercury			101	70-130			11/30/2023	SAS	
Matrix Spike Dup (B234760-MSD1) Source ID: AC00324-03									
Mercury			103	70-130	0.0974	20	11/30/2023	SAS	
Matrix Spike Dup (B234760-MSD2) Source ID: EP00285-01									
Mercury			104	70-130	2.73	20	11/30/2023	SAS	
Dissolved Metals									
Batch: B234723									
Blank (B234723-BLK1)									
Cadmium	<0.010	ug/L					11/25/2023	DMW	U
Copper	<0.15	ug/L					11/25/2023	DMW	U
Lead	<0.0090	ug/L					11/25/2023	DMW	U
Zinc	<0.50	ug/L					11/25/2023	DMW	U
LCS (B234723-BS1)									
Cadmium			94.9	85-115			11/25/2023	DMW	
Copper			94.3	85-115			11/25/2023	DMW	
Lead			96.9	85-115			11/25/2023	DMW	
Zinc			93.8	85-115			11/25/2023	DMW	
Duplicate (B234723-DUP1) Source ID: AC00324-02									
Cadmium					5.41	10	11/25/2023	DMW	
Copper					0.546	10	11/25/2023	DMW	
Lead					1.75	10	11/25/2023	DMW	
Zinc					0.526	10	11/25/2023	DMW	
Matrix Spike (B234723-MS1) Source ID: AC00324-02									
Cadmium			96.5	70-130			11/25/2023	DMW	
Copper			104	70-130			11/25/2023	DMW	
Lead			93.1	70-130			11/25/2023	DMW	
Zinc			103	70-130			11/25/2023	DMW	
Matrix Spike Dup (B234723-MSD1) Source ID: AC00324-02									
Cadmium			97.9	70-130	1.50	10	11/25/2023	DMW	
Copper			103	70-130	0.713	10	11/25/2023	DMW	
Lead			94.5	70-130	1.37	10	11/25/2023	DMW	
Zinc			99.7	70-130	0.915	10	11/25/2023	DMW	

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Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846

Janet Finegan-Kelly
Water Quality Laboratory Manager

Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order: 6

63065628

Stormwater-PI

Steven Turner

Kristen Chisholm

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>[Signature]</i>	11/19/2023 1:42 PM	<i>[Signature]</i>	11/19/23

Acco 324

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628
Stormwater-PI
Steven Turner
Kristen Chisholm

Attn: Steven Turner 3775 Adams Street Garden City, Idaho 83714-6418 Tel. (208) 387-6269 Fax (208) 387-6391 Purchase Order: Project: Sampler(s):						63065628 Stormwater-PI Steven Turner Kristen Chisholm																				
Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type																		
							Water		Grab	Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
AC00324-01	11/19/23	←	314	1221	231119-206-WC	ST	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Steven Turner</i>	11/19/2023 1:42pm	<i>Brian Kelly</i>	1342 11/19/23

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628

Stormwater-PI

Kristen Christensen
Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix		Type	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
							Water	Grab	Composite																
AE00324-03	11/19/23		214	1328	231119-03-WC	ST	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Kristen Christensen</i>	11/19/23 1603	<i>Steven Turner</i> 1603	11/19/23

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order: 6
Project: S
Sampler(s):

63065628
Stormwater-PI
Steven Turner
Kristen Chisholm

AE00324-04	11/17/23.	0224 1528 231119-11-WC	ST	x	x	x x x x x x x x	x x x x 3
-05	└─┘	G107 1442 231119-12-WC	ST	x	x	x x x x x x x x	x x x x 3
-06		U132 1407231119-14-WC	ST	x	x	x x x x x x x x	x x x x 4

Kosten/Kosten	11/19/23 1716	Besuch 1716	11/19/23

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 1 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots 47-32, 47-73, 47-20	Bottles Split	Comments
#1 Lims#: <u>AC00324-02</u> Location: <u>ACSTIC</u> Sample Date: <u>11-19-23</u> Sample ID: <u>23119- -206-WC</u>	Split Date: <u>11-19-23</u> Start Split: <u>1402</u> Start Filter: <u>1402</u> Comp Time: <u>1356</u> Analyst: <u>DMW/WR</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>47-73</u> Comp Jug: <u>CC00023-78</u> SS Tubing: <u>CC00044-92</u> SS Helper: <u>SSAS</u> ↓ Stir Bar: <u>CC00047-50</u> Connector: <u>CC00044-99</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	0.45µm High Capacity ^{color prof} Very black-looking; leaves minimal debris 4 jugs
#2 Lims#: <u>AC00324-03</u> Location: <u>ACSTIC</u> Sample Date: <u>11-19-23</u> Sample ID: <u>23119-03</u> -WC	Split Date: <u>11-19-23</u> Start Split: <u>1620</u> Start Filter: <u>1620</u> Comp Time: <u>1617</u> Analyst: <u>DMW/WR</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>47-32, 47-88</u> Comp Jug: <u>CC00030-62</u> (x2) SS Tubing: <u>CC00047-43</u> SS Helper: <u>SSAB</u> ↓ Stir Bar: <u>CC00047-50</u> Connector: <u>CC00047-89</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	0.45µm High Capacity Dark minimal debris 2 jugs
#3 Lims#: <u>AC00324-06</u> Location: <u>ACSTIC</u> Sample Date: <u>11-19-23</u> Sample ID: <u>23119-14</u> -WC	Split Date: <u>11-19-23</u> Start Split: <u>1728</u> Start Filter: <u>1728</u> Comp Time: <u>1723</u> Analyst: <u>DMW/WR</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>47-32, 47-88, 47-32</u> Comp Jug: <u>CC00010-72</u> SS Tubing: <u>CC00047-43</u> SS Helper: <u>SSI2</u> ↓ Stir Bar: <u>CC00047-50</u> Connector: <u>CC00040-06</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	0.45µm High Capacity Minimal debris (1) of the 16L jugs didn't have cert label 4 jugs
#4 Lims#: <u>AC00324-04</u> Location: <u>ACSTIC</u> Sample Date: <u>11-19-23</u> Sample ID: <u>23119-11</u> -WC	Split Date: <u>11-19-23</u> Start Split: <u>1752</u> Start Filter: <u>1752</u> Comp Time: <u>1748</u> Analyst: <u>DMW/WR</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>47-73, 47-32</u> Comp Jug: <u>CC00023-78</u> SS Tubing: <u>CC00039-99</u> SS Helper: <u>SSI7</u> ↓ Stir Bar: <u>CC00047-67</u> (x2) Connector: <u>CC00040-06</u>	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	0.45µm High Capacity (1) of the 16L jugs missing cert. label. Minimal debris 3 jugs
#5 Lims#: <u>AC00324-05</u> Location: <u>ACSTIC</u> Sample Date: <u>11-19-23</u> Sample ID: <u>23119-12</u> -WC	Split Date: <u>11-19-23</u> Start Split: <u>1814</u> Start Filter: <u>1814</u> Comp Time: <u>1811</u> Analyst: <u>DMW/WR</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>47-73, 47-88</u> Comp Jug: <u>CC00011-67</u> SS Tubing: <u>CC00047-85</u> SS Helper: <u>SSA2</u> ↓ Stir Bar: <u>CC00047-67</u> Connector: <u>CC00040-06</u> (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	0.45µm High Capacity (1) of the 16L missing cert. label. minimal debris 3 jugs

39-76 (x2)

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 2 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
#6 Lims#: _____ Location: _____ Sample Date: <u>11-19-23</u> Sample ID: _____	Split Date: <u>11-19-23</u> Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: <u>DMW/JPR</u>	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: _____ Comp Jug: _____ SS Tubing: <u>C00047-39</u> SS Helper: <u>SS9</u> Stir Bar: <u>C00047-90</u> Connector: <u>C00041-46</u>	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	<u>0.45µm High Capacity</u> <u>Not Needed</u>
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ _____ ☒ COD ☐ _____	



Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 801.316.9859

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2024

Project No.: 159103

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for February 1, 2024

Date: April 23, 2024

To: Monica Lowe

Cc: Steven Turner

Kristen Chisholm

From: Zuly Lapa, Project Engineer

Prepared by: Zuly Lapa, EIT, Project Engineer

Reviewed by: Melissa Jannusch, PE, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 10, 2023. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The Environmental Protection Agency Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2024 (October 1, 2023, through September 30, 2024). The following storm event report summarizes stormwater sampling results from the February 1, 2024, storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2024 Phase I Stormwater Outfall Monitoring. When samples are qualified, additional samples will be attempted from subsequent storms to collect unqualified samples.

Table 2-1. WY 2024 Samples Collected					
Date	Lucky	Whitewater	Main	Americana	AS_6
October 10, 2023	G, C ^{1,2}	G	--	G, C ³	--
November 19, 2023	G, C	G, C	G, C	G ⁴ , C	G, C
February 1, 2024	G ⁵ , C	G ⁵ , C ⁶	G ⁵ , C	G ⁵ , C	G ⁵ , C
Unqualified Samples:	2G, 2C	2G, 1C	1G, 2C	1G, 2C	1G, 2C
Samples Remaining:	1G, 1C	1G, 2C	2G, 1C	2G, 1C	2G, 1C

Notes:

-- = no samples taken

C = composite sample

G = grab sample

¹ Composite samples qualified due to lack of representativeness (50%–75%).

² Incomplete water quality analysis due to low composite sample volume.

³ Composite samples qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

⁴ Grab sample qualified due to incomplete field parameter collection.

⁵ E. coli sample qualified due to exceeded hold time.

⁶ Composite sample rejected due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented more than 10% of the composite volume.

Section 3: Storm Event Summary

The February 1, 2024, storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A summary of the forecast on which monitoring decisions were based is detailed below. The sampling event communication form that describes the forecast and summarizes the decision-making process from February 1, 2024, is included in Attachment A for reference.

Wednesday, January 31, 2024 (Sampling Event Communication and Set Up)

- On the morning of January 31, the National Weather Service issued a forecast for widespread rain in the Boise area, starting February 1 at 0500 and ending on February 2 at 1100. The chance of precipitation was greater than 90%, with 0.50 inches of precipitation forecasted.
- Setup was accomplished in the afternoon of January 31. An expected precipitation depth of 0.3 inches was used to set trigger volumes at monitoring stations. A runoff calculations worksheet showing how the trigger volumes were calculated is included in Attachment A.

Thursday, February 1, 2024 to Friday, February 2, 2024 (Storm Event)

- Moderate rain first started at approximately February 1 at 1607 and ended on February 2 at 1305.
- Precipitation totals ranged between 0.31 and 0.37 inches at local rain gauges.

Flow measurements and precipitation data are listed in Table 1 along with a sampling summary. Hydrograph for the Lucky, Whitewater, Main, Americana and AS_6 site showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Main, Americana and AS_6 monitoring stations were set up on January 31, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programed into the Lucky, Whitewater, Main and Americana flowmeters. A site-specific velocity cutoff value was programmed into AS_6 flowmeter. Setup and sampling information are included in Table 1. The field forms completed during setup/shutdown and sampling are included in Attachment C.

Grab Samples

Two, two-member teams mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on February 1 at 1800. Grab samples for Lucky, Whitewater, Main, Americana, and AS_6 were submitted to the West Boise Water Quality Lab (WQL) at 2032 on February 1.

Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment D.

Composite Samples

Composite samples were collected at the Main, Americana and AS_6 monitoring station and submitted to the WQL at 1101 and 1102 on February 2. The composite samples at Lucky and Whitewater monitoring stations were submitted to the WQL at 1154 on February 2.

Analytical results are shown in Table 2 and pollutant loading estimates for the event are detailed in Table 3. Laboratory analytical reports are included in Attachment D.

Section 4: Quality Assurance/Quality Control

A summary of quality control samples collected during the February 1, 2024, storm event is presented below in Table 4-1. A field blank and field duplicate was collected from the Lucky monitoring station and a lab duplicate/composite split was collected from the Whitewater monitoring station. The analytical results for these samples are included in Table 4-1.

Table 4-1. Quality Control Samples			
Sample ID	Sample Type	Parent Sample	Conclusions
240201-03-001	Field blank	Lucky grab	No <i>E. coli</i> detection was reported in the field blank.
240201-03-101	Field duplicate	Lucky grab	Relative percent difference was not within the acceptable range. Field duplicate qualified due to exceeding <i>E. coli</i> hold time.
240201-11-103	Lab duplicate/composite split	Whitewater composite	The Whitewater composite parent sample was rejected due to non-stormwater subsamples, leading to an inaccurate relative percent difference.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A.

An acceptable composite sample represents at least 75 percent of the total discharge or at least 6 hours of the storm duration. All composite samples, except for Whitewater, met the criteria. However, all the grab samples, including the QC field duplicate were qualified due to *E. coli* exceeding hold time. A grab sample is qualified if the sample is prepared 8 to 16 hours after sample collection. Samples are rejected if prepared 16 hours or later after sample collection. All samples were prepared within approximately 12 hours of sample collection and are therefore qualified.

Prior to the start of the storm precipitation or runoff, five subsamples were successfully collected by the automatic sampler at the Whitewater monitoring site. These subsamples are considered non-stormwater, as there was no evidence of flow or precipitation during the morning of January 31st through the afternoon of February 1st. Following the SWOMP guidelines, calculations were conducted to determine if the non-stormwater subsample volume accounted for 10% of the total composite sample volume. The non-stormwater composite subsamples accounted for 12% of the total composite sample volume (see Table 4-2), rejecting the Whitewater composite sample.

Table 4-2. Non-Stormwater Subsample Evaluation		
Composite Sample Volume (ft ³)	Non-Stormwater Subsample Volume (ft ³)	Non-stormwater Subsample Ratio
74,325	8,744	12 %

Section 5: Notes and Recommendations

Whitewater

The sampling team identified the automatic sampler's clock was not synchronized with the flowmeter, resulting in incorrect subsample times displayed on the sampler. The sampling team recorded actual composite subsample times from the flow meter prior to submitting the chain of custody form to the WQL. Additionally, the five subsamples collected before the start of storm flow were due to a flowmeter programming error. It was determined the STORM EVENT and SAMPLER ENABLE equations were assigned the wrong threshold conditions. Specifically, STORM EVENT had the threshold condition assigned rather than the timetable condition. SAMPLER ENABLE had the timetable equation set. Therefore, the flowmeter was incorrectly programmed to enable the sampler 24 hours a day and pull a sample every 2185 cubic feet

without a minimum level condition. The early subsamples appear to be equally spaced apart because of the poor velocity signal, which resulted in the velocity reading a constant value before the start of storm flow. In the case of poor velocity signal readings, the flowmeter will continue to record the last velocity reading until it is able to get another valid reading. For this reason, the sampler was collecting subsamples before increased levels as expected during storm flows.

AS_6

After collecting the grab sample at AS_6, the sampling team noticed a build-up of leaves on the sensor. The sampling team immediately cleared the sensor, and flow started moving rapidly. The removal of leaves seemed to normalize the flow.

Data Tables



TAB-1

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	YES	YES	YES	YES
Composite samples collected and submitted?	YES	YES	YES	YES	YES
Trigger volume (gal or ft ³)	7899 gal	2185 ft ³	9313 gal	8071 ft ³	601 ft ³
Velocity cutoff (fps)	--	--	--	--	0.02
Sampler enable condition (in)	Level > 2.68"	Level > 2.55" ⁴	Level > 2.06"	Level > 6.46"	--
Runoff start time	1747 ¹	1647 ¹	1657 ¹	1607 ¹	1823 ¹
Grab sample collection time	1825	1859	1815	1841	1906
Composite sample stop time	0926	1016	0757	0936	0936
Runoff stop time	1135 ²	1305 ²	1132 ²	1220 ²	1108 ²
Volume of discharge sampled (ft ³)	12,963	74,325 ³	17,733	216,570	13,220
Volume of non-stormwater subsamples (ft ³)	--	8,744	--	--	--
Total runoff volume (ft ³)	14,425	71,141	19,927	260,647	15,912
Percent of storm flow sampled (%)	90%	104% ³	89%	83%	83%
Percent of non-stormwater volume to total discharge sampled volume (%)	--	12%	--	--	--
Composite sample duration (hrs)	14.5	40 ³	13	13.5	10.5
Storm Precipitation (in)	0.31	0.33	0.31	0.31/0.37	0.31/0.37
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	13	36	15	29	24
Number of composite bottles filled	1	2	1	2	2
Composite sample volume (Approx.; ml)	7,250 ml	19000 ml	10250 ml	14500 ml	24400 ml

Notes:

-- = No data.

¹ Storm runoff started on 2/1/24

² Storm runoff ended on 2/2/24

³ Non stormwater samples were collected prior to the start of storm precipitation or runoff

⁴ Programming error occurred at setup

Table 2. Field and Analytical Data Summary																											
Monitoring Station	Sample Date	Sample ID Grab	Field Parameters						Sample ID Composite	Analytical Parameters																	
			Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	80D ₅		COD	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C	mpn/100 mL	mg/L		mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	2/1/2024	240201-03-WG	4.92	7.15	593.29	14.62	<1.0 ^{4J}	240201-03-WC	7.27	39.0	16.0	60.5	18.8	52.8	0.174	0.100	0.173	0.204	0.894	0.85	<0.0100	0.024	2.0	0.056	0.82	<0.0100	17.5
Whitewater	2/1/2024	240201-11-WG	8.42	7.60	287.02	11.10	68.9 ^{4J}	240201-11-WC	9.34 ^{3R}	82 ^{3R}	43 ^{3R}	106 ^{3R}	58.4 ^{3R}	139 ^{3R}	0.321 ^{3R}	0.171 ^{3R}	0.169 ^{3R}	0.375 ^{3R}	1.33 ^{3R}	2.4 ^{3R}	<0.0100 ^{3R}	0.058 ^{3R}	3.9 ^{3R}	0.18 ^{3R}	4.8 ^{3R}	0.0148 ^{3R}	25.7 ^{3R}
Main	2/1/2024	240201-12-WG	10.11	8.03	353.6	6.30	238.2 ^{4J}	240201-12-WC	5.74	77.0	18.3	103	59.8	64.2	0.143	0.0557	0.351	0.209	1.12	1.4	0.012	0.066	3.6	0.084	4.1	0.0112	18.4
Americana	2/1/2024	240201-14-WG	10.05	7.73	552.2	8.34	65.0 ^{4J}	240201-14-WC	6.98	55.0	93.3	89.6	50.7	224	0.213	0.116	0.193	0.905	1.05	3.4	0.016	0.063	3.4	0.090	4.2	<0.0100	17.3
AS_6	2/1/2024	240201-206-WG	9.33	8.03	542.9	5.55	290.9 ^{4J}	240201-206-WC	11.6	108	16.8	143	70.3	116	0.464	0.285	0.159	0.191	1.83	3.0	0.013	0.077	4.5	0.29	6.7	0.0168	10.5

Notes:
-- 3R No data.
^{3R} Composite sample rejected due to non stormwater sample volume comprising 10% or more of the the total composite sample volume
^{4J} E. coli sample qualified due to exceeded hold time

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
Lucky	2/1/2024	16.9	0.157	0.156	0.184	0.805
Whitewater	2/1/2024	168 ^{1R}	0.92 ^{1R}	0.750 ^{1R}	1.08 ^{1R}	3.81 ^{1R}
Main	2/1/2024	74.4	0.178	0.437	0.260	1.39
Americana	2/1/2024	825	3.46	3.140	14.7	17.1
AS_6	2/1/2024	69.8	0.46	0.158	0.190	1.82

Notes:

^{1R} Composite sample rejected due to non stormwater sample volume comprising 10% or more of the the total composite sample volume

Table 4. QC Sample Summary																							
Date	Parent Sample	Sample ID	Type	E. coli	BOD ₅	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
				mpn/100 mL	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
2/1/2024	240201-03-WG	240201-03-001	Field Blank	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/1/2024	240201-03-WG	240201-03-101	Field Duplicate	2 ⁴¹	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calculated parent/duplicate RPD ¹				100%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
2/1/2024	240201-11-WC	240201-11-103	Lab Duplicate/Composite Split	--	8.9	83.0	42.4	113	53.8	140	0.312	0.172	0.170	0.378	1.35	2.4	0.011	0.052	3.7	0.19	4.9	0.0127	26.6
Calculated parent/duplicate RPD ²				--	5%	1%	1%	6%	8%	1%	3%	1%	1%	1%	1%	0%	10%	11%	5%	5%	2%	15%	3%
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%

Notes:

¹ Relative percent difference was not within the acceptable range. Field duplicate qualified due to exceeding E. Coli hold time

² The Whitewater composite parent sample was rejected due to non-stormwater subsamples, leading to an innacurate relative percent difference

⁴¹ E.coli sample qualified due to exceeded hold time

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 01/31/2024	Time: 9:39 AM	Initials: ML
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Yes

Past 72 hr Precip	0.06"
Date and time of expected event	2/1/2024 5am – 2/2/2024 5am-11am?
Expected amount of precipitation	Up to 0.5"
Percent chance of precipitation	90%
Percent chance of >0.10" over 12 hours	30-40% during Thursday 5am-5Pm

NWS Update

I spoke with Bill from the NWS. They said precip could start as early as 5-8am Thursday morning but are only expecting maybe a tenth throughout the day. Precip expected to pick up in the afternoon and into the evening especially after 5PM. The storm is predicted to be continuous and widespread once it starts with breaks and rain shadowing unlikely. Storm should be over ~5am but could be as late as 11am depending pace of storm.

<u>Targeted Station & Samples</u>					
Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☒ Grab	☒ Grab	☒ Grab	☒ Grab	☒ Grab
☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite

Type of Forecasted Precipitation

☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☐ Thunder Showers	☐ Snowmelt
☐ Other:		

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday

☐ Waiting on Antecedent Dry Period – Expires:

☐ Equipment Concerns:

☐ Other:

Text Forecast

NWS Forecast for: 2 Miles NNW Garden City ID
 Issued by: National Weather Service Boise, ID
 Last Update: 3:29 am MST Jan 31, 2024

Today: Mostly sunny, with a high near 63. Southeast wind 7 to 17 mph, with gusts as high as 26 mph.
 Tonight: A 20 percent chance of rain after 11pm. Mostly cloudy, with a low around 44. East southeast wind 13 to 15 mph, with gusts as high as 24 mph.

Thursday: Rain. High near 56. Southeast wind 14 to 16 mph, with gusts as high as 25 mph. Chance of precipitation is 90%. New precipitation amounts between a tenth and quarter of an inch possible.

Thursday Night: Rain. Low around 39. Southeast wind 5 to 9 mph becoming light and variable in the evening. Chance of precipitation is 80%. New precipitation amounts between a quarter and half of an inch possible.

Friday: Rain likely, mainly before 11am. Mostly cloudy, with a high near 48. West northwest wind 3 to 8 mph. Chance of precipitation is 60%.

Friday Night: A 40 percent chance of rain. Mostly cloudy, with a low around 35.

Saturday: A 30 percent chance of rain, mainly before 11am. Mostly cloudy, with a high near 45.

Saturday Night: Mostly cloudy, with a low around 31.

Sunday: Mostly sunny, with a high near 47.

Sunday Night: A 40 percent chance of rain, mainly after 11pm. Mostly cloudy, with a low around 35.

Monday: A chance of rain and snow. Mostly cloudy, with a high near 49. Chance of precipitation is 50%.

Monday Night: A 50 percent chance of rain. Mostly cloudy, with a low around 36.

Tuesday: A 50 percent chance of rain. Mostly cloudy, with a high near 49.

Forecast Discussion

National Weather Service Boise ID

243 AM MST Wed Jan 31 2024

.SHORT TERM...Today through Friday night...A pattern shift towards [normal](#) late winter conditions is expect on Thursday as the large [upper level](#) low reaches the Pacific Northwest. However, until then, unseasonably warm temperatures will continue today with record high temperatures forecast for several valley locations. The approaching Pacific system will enhance the pressure [gradient](#) for gusty southeast winds in the Snake Plain today. Gusts are expected to be in the 30-40 mph range.

Expect record temperatures in the Treasure Valley today aid by a much stronger southeasterly winds in response to the approaching [upper level](#) low. Model guidance has consistently under forecast temperatures the last 6 days and looks to be under forecasting today by another 3 to 5 degrees. Thus, used a bias corrected [analog](#) which has worked well the last couple of nights. This correction gives a 70% chance of Boise reaching 64 degrees or greater today. The forecast high of 64 would not only break the daily record of 61, but also tie the all-time record of 63 (set on Jan 9, 1953). Temperatures will start to cool down on Thursday with the arrival of widespread clouds and precipitation. A [Public Information Statement](#), BOIPNSBOI, includes the updated forecast highs and records.

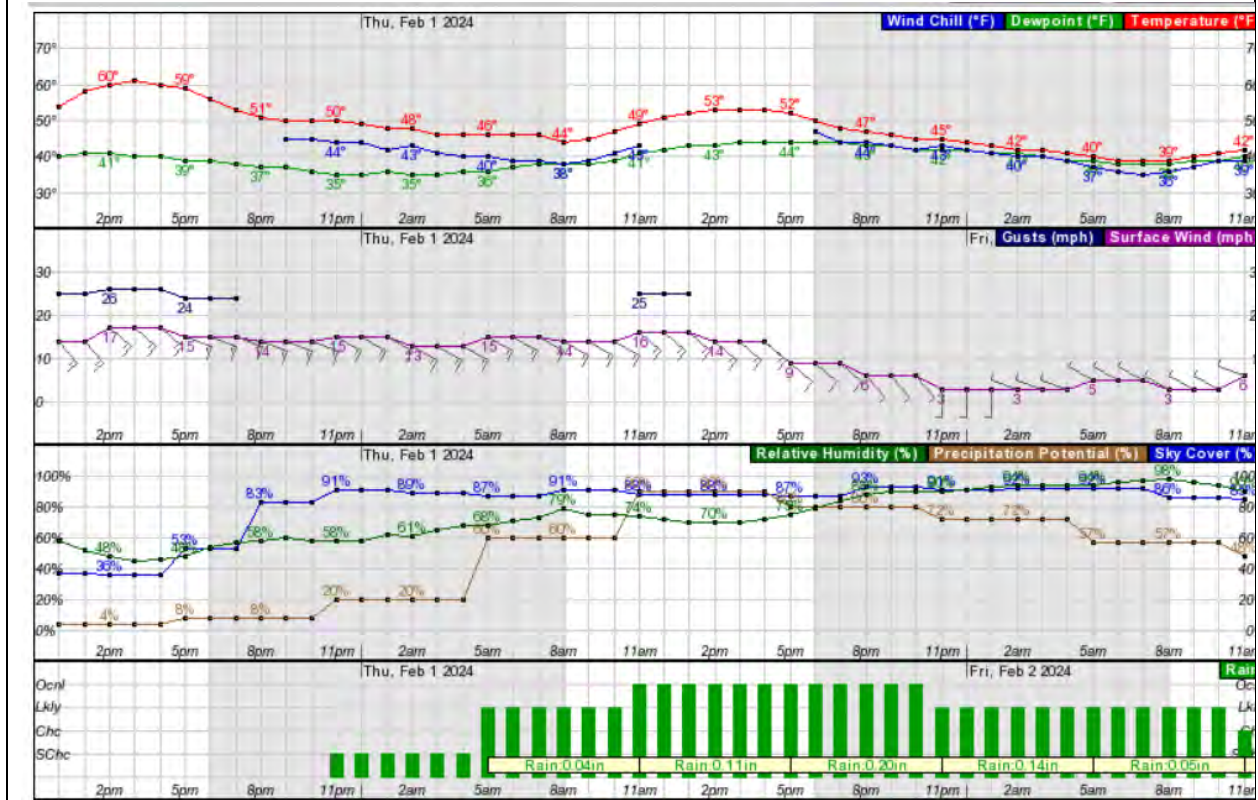
[Fog](#) and [stratus](#) has remained persistent across the valleys of Southeast Oregon the last couple of days. However, this should begin to dissipate today with better mixing and increased surface winds ahead of the next system.

A very moist plume of Pacific [moisture](#) off the west coast, known as an atmospheric river, associated with an [upper level low pressure system](#), will move inland this afternoon. This will spread the [moisture](#) across our area late tonight into Thursday. Snow levels near 7000 feet today will lower to around 6000 feet on Thursday. Accumulating snow will be limited to the mountains. Precipitation totals of up to a half inch in the valleys and an inch in the mountains are expected.

.LONG TERM...Saturday through Wednesday...A weak [upper level trough](#) remains over the region Saturday and Sunday continuing the threat for light snow showers in the mountains and a mix of rain and snow in the valleys. The [low pressure system](#) over the west coast will again interact with another plume of [moisture](#) from the Central Pacific (or Atmospheric River) on Sunday which looks to spread across our area from the southwest on Monday. Snow levels remain around 4000 feet for snow in the mountains and cold rain in the valleys. There is growing confidence in the system for Monday however, there is quite a large spread on the amount of [moisture](#) that makes it into the Intermountain West. Colder but drier conditions follow as the

the region remains on under a [large scale trough](#) as the low center continues south along the California coast.

Hourly Forecast



Storm Event QA/QC Checklist – Phase I

STORM DATE 2/1/24

A. Event and Data Completeness	Yes	No	N/A	Notes					
1. Field data sheets filled out completely and clearly	X								
2. Field parameters reviewed, and any problems/issues addressed	X			Whitewater FM and SA clocks werent synced during setup					
3. All samples collected as specified	X								
4. All samples delivered to lab promptly (review chain of custody rpts)	X								
5. Inconsistencies/clarifications discussed with sampling team member			X						
6. All analytical reports from lab received	X								
B. Validation and Verification Methods	Yes	No	N/A	Notes					
1. Outliers and unexpected values discussed with lab			X						
2. Appropriate analytical methods used	X								
3. All lab QA samples were within method acceptance criteria	X								
4. All samples reviewed and data qualifiers assigned if needed	X								
5. Data quality objective achieved	X								
C. Specific Storm and Sample QA/QC Criteria	Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)	0.00	0.00	0.00	0.00	0.00	< 0.11" in 72 hrs	X		
2. Precipitation (inches)	0.31	0.33	0.31	0.31/0.37	0.31/0.37	> 0.10"	X		
3. Sampled amount (% of total run-off)	90%	104%*	89%	83%	83%	>= 75% or >= 6 hrs: no qualifier >= 50% and <75%: qualify < 50%: reject	X		X _{ww}
4. Composite sample duration (hours)	14.5	40	13	13.5	10.5	<=8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject		X	
4. Ecoli sample holding time (hours)	12	11.5	12	12	12	<= 24 hrs: no qualifier > 24 hrs.: reject	X		
5. Filtering of samples for dissolved parameter analysis (hours)	3.5	2.0	3.0	2.0	2.0				
D. Notes									
E. coli: samples were qualified due to exceeded holding times from all sites. * Whitewater composite rejected due to >10% total sample volume composed of non-stormwater.									

Reviewed by Steven Turner Date 2/4/24

Approved by Monica Lowe Date 4/9/24

Storm Runoff Estimates and Trigger Volumes

Step 1. Enter runoff coefficients in yellow cells.

Step 2. Enter expected precipitation depth (in) in blue cell.

Step 3. Read trigger volumes (**bold**) in green cells.

Expected Precipitation Depth = 0.3

Aliquots per Sample = 17

Site	Area (ac)	Using RC calculated from flow data		
		RC	Expected Vol (ft ³)	Trigger Vol (ft ³)
Lucky	105	0.157	17952.2	1056
Whitewater	498	0.069	37149.1	2185
Main	79	0.246	21163.6	1245
Main Alt	60	0.200	13068.0	769
Americana	875	0.144	137214.0	8071
AS_6	204	0.046	10219.2	601
State	34	0.160	5924.2	348

Notes:

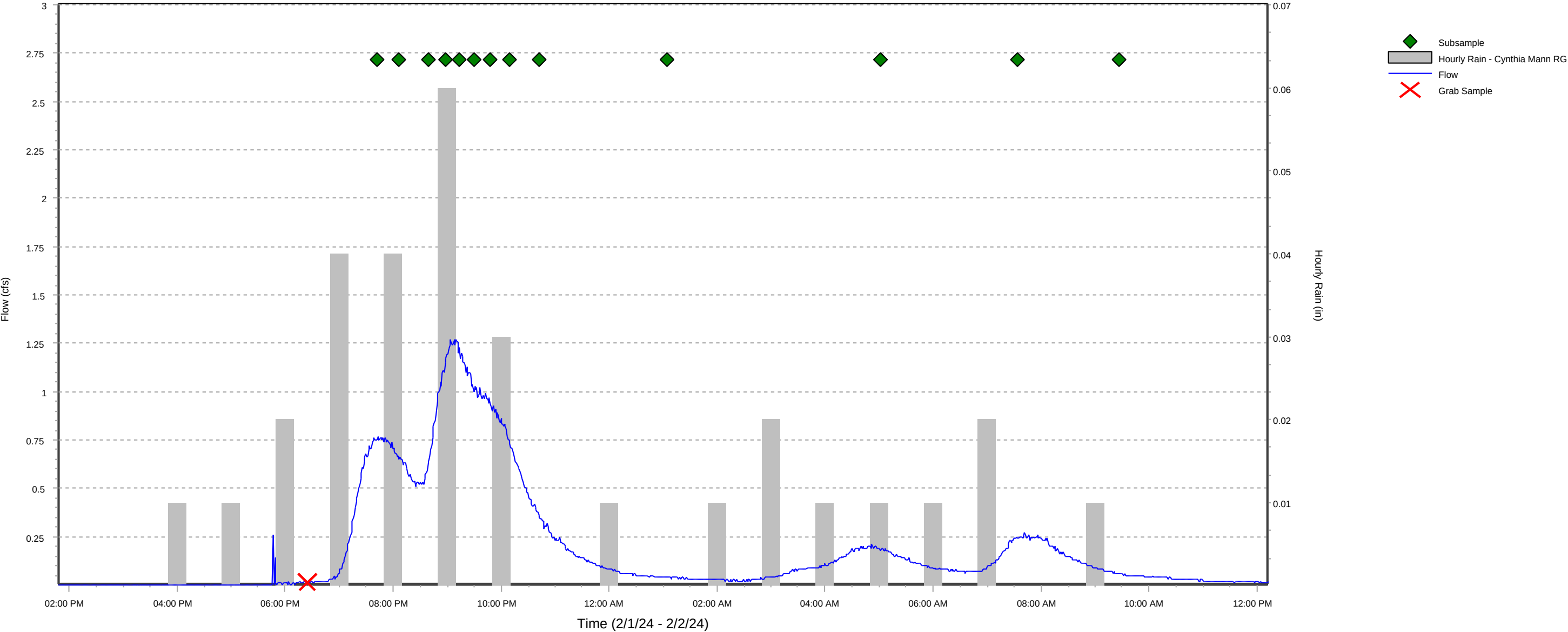
Calculated RC = Average (precip (ft) / [volume (ft³) x area (ft²)])

Where precip (ft) is the measured amount from local rain guage, and volume (ft³) is the measured discharge, and area (ft²) is the watershed area

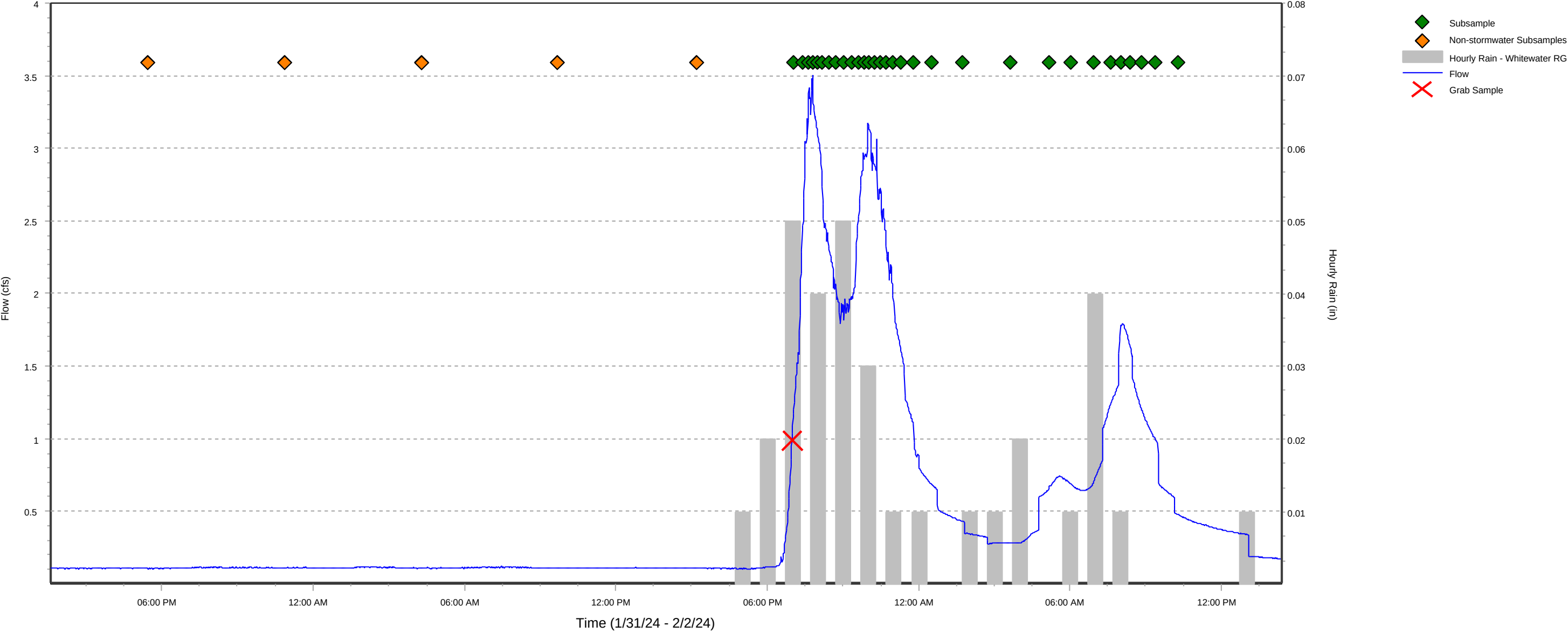
Expected volume (ft³) = RC x expected precip (ft) x area (ft²)

Attachment B: Storm Event Hydrographs

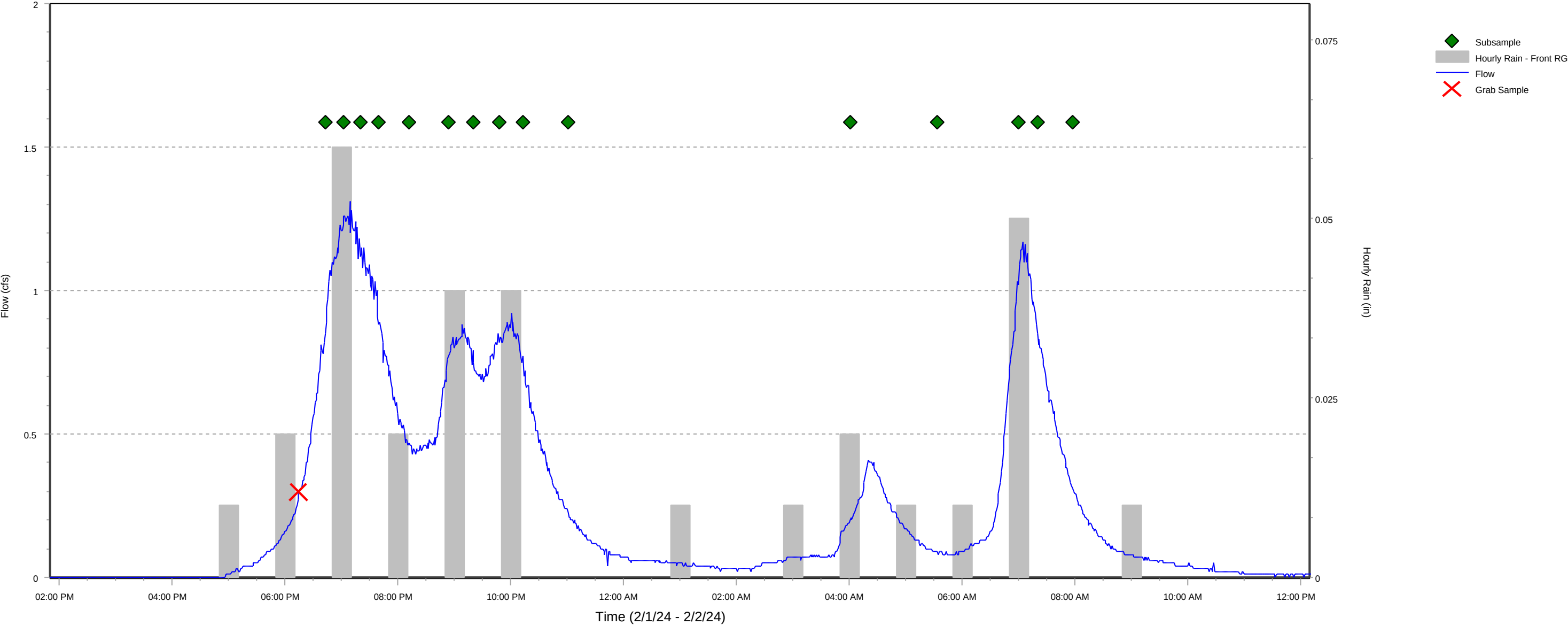
Lucky Hydrograph



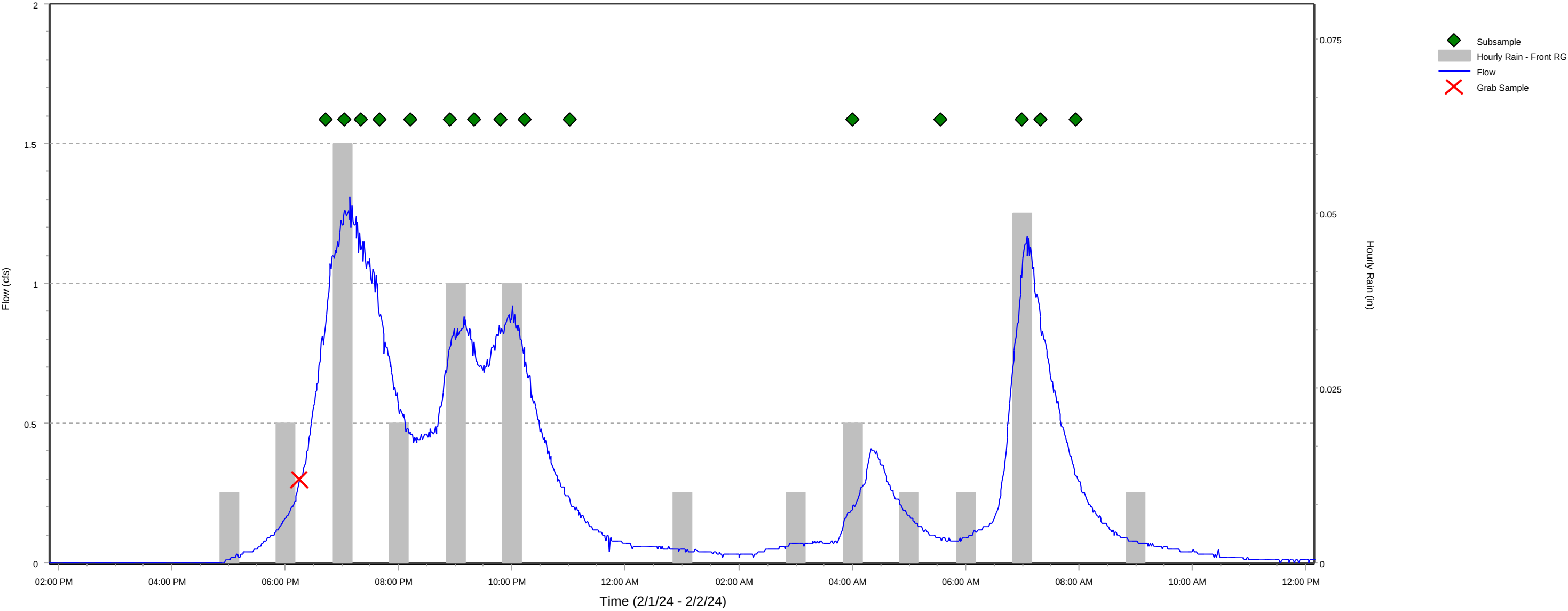
Whitewater Hydrograph



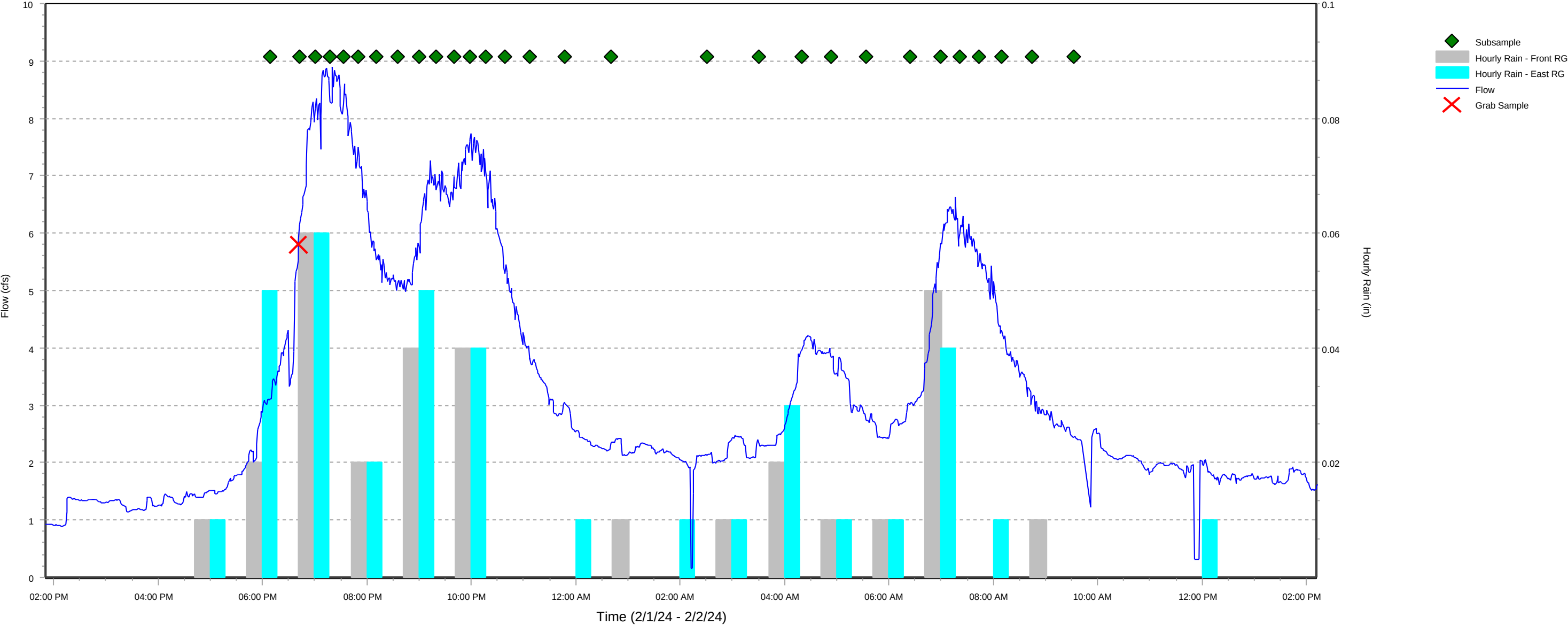
Main Hydrograph



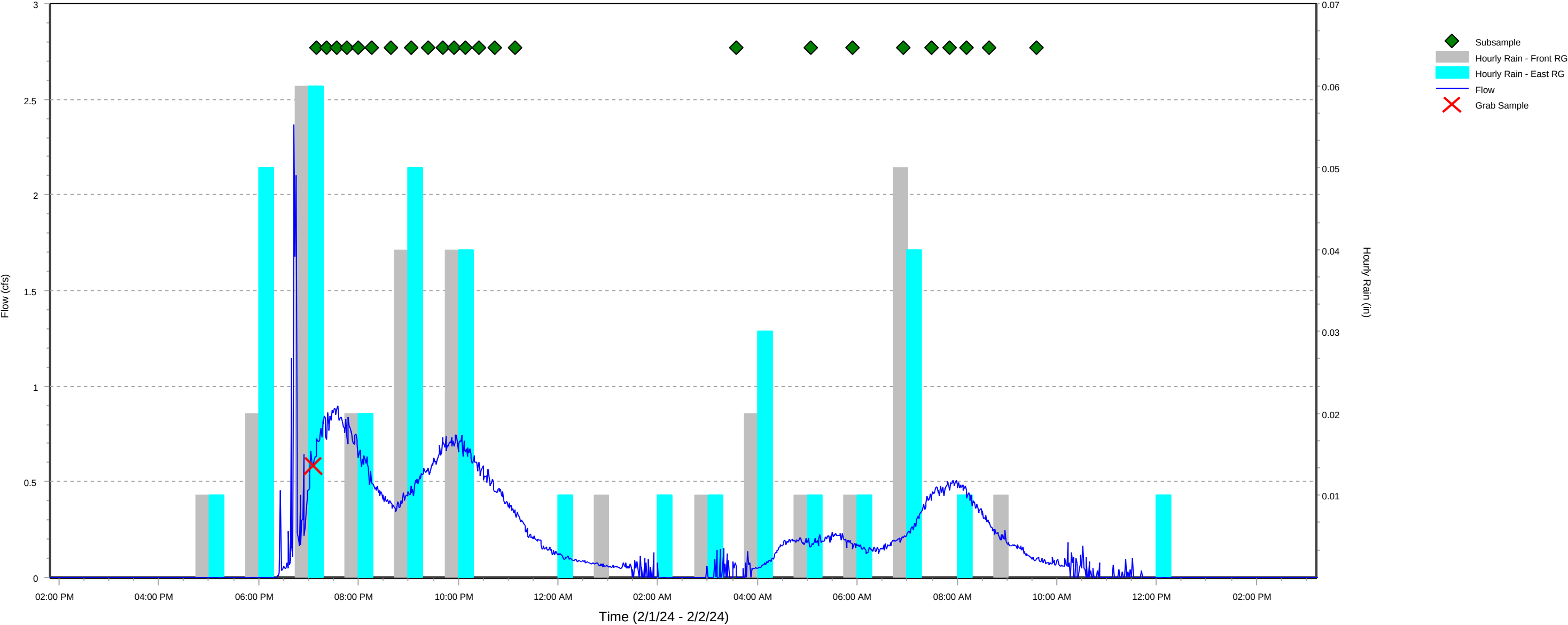
Main Hydrograph



Americana Hydrograph



AS_6 Hydrograph



Attachment C: Field Forms

Grab Sample Data Form

STATION: Lucky 1800
 Personnel: Tim / Chad Date/Time On-Site: 1800 2/1/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1807	1.96"	2.55	.06	12.8	2/1/24 1800	

Grab Information				
	Sample ID	Date	Time	Labeled?
Site E.Coli	240201-03 -WG	2/1/24	1825	☒
Field Duplicate E.Coli	240201-03 -101	2/1/24	1830	☒
Field Blank E.Coli	240201-03 -001	2/1/24	1830	☒

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
1019508	1819	14.62	4.92	7.15	593.29

MP11

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	0/0

Comments:

Grab Sample Data Form

STATION: White Water

Personnel: Chad Tim Date/Time On-Site: 2/1/24 1846

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1846	2.79	.27	0.67	—		

Grab Information					
	Sample ID		Date	Time	Labeled?
Site E.Coli	24020111	-WG	2124	1859	☒
Field Duplicate E.Coli		-101			☐
Field Blank E.Coli		-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
~~1019508~~ MP11	1855	11.10	8.42	7.60	287.02

Sampler Current Status	
First Subsample Date/Time	~~05/28~~ 2/1/24 1337
Last Subsample Date/Time	2/1/24 1904
# of Subsamples taken	6

Comments:

Grab Sample Data Form

STATION: Main

Personnel: MB, KC Date/Time On-Site: 1804 2/1/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1804	3.17"	79.57	0.64	12.7		

Grab Information					
	Sample ID		Date	Time	Labeled?
Site <i>E. Coli</i>	240201-12	-WG	2/1/24	1815	☒
Field Duplicate <i>E. Coli</i>	240201-12	-101	2/1/24	1818	☒
Field Blank <i>E. Coli</i>	240201-12	-001	2/1/24	1812	☒

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	1819	6.3	10.11	8.03	353.6

Sampler Current Status	
First Subsample Date/Time	NA
Last Subsample Date/Time	
# of Subsamples taken	NA

Comments:

main - alternate QC site. lucky grab QC successful, so main QC discarded and not submitted to lab. wh

Grab Sample Data Form

STATION: Americana

03/01/2024

Personnel: MB, VC

Date/Time On-Site: 1835

~~020724~~ 03/01/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1835	8.54	3.29	2.172	12.1		

Grab Information					
	Sample ID	Date	Time	Labeled?	
Site <i>E.Coli</i>	24020514 -WG	2/1/24	1841	☒	
Field Duplicate <i>E.Coli</i>	-101			☐	
Field Blank <i>E.Coli</i>	-001			☐	

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	1845	8.34	10.05	7.73	552.2

Sampler Current Status	
First Subsample Date/Time	1811 03/01/24
Last Subsample Date/Time	
# of Subsamples taken	1

Comments:

Offsite @ 1850

Grab Sample Data Form

STATION: AS-6

Personnel: MB-KC Date/Time On-Site: 02/01/2024 1855

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1911	4.67	0.71	1.76	12.5		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E. Coli</i>	240201-20 -WG	02/01/2024	1900	☒
Field Duplicate <i>E. Coli</i>	-101			☐
Field Blank <i>E. Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MPO7	1910	5.55	9.33	8.03	540.9

Sampler Current Status	
First Subsample Date/Time	1844 02/01/24
Last Subsample Date/Time	1909 02/01/24
# of Subsamples taken	2 (1 missed)

Comments:

missed sample #
 first sub sample had rinse error
 cleaned leaves of rinse tubing
 offsite @ 1913

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: Lucky

SET UP

Personnel: MB, SJ, TA, JC, KC

Date/Time: Jan 31, 24 11:00

On-Site: Jan 31, 24 11:00

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
~~11:00~~	~~1.00~~	~~0.00~~	~~0.00~~	~~13.0~~
11:31	1.08	0.00/min	0.00	13.0
Enable Condition or Velocity Cutoff:			~~2.00~~	2.08" (ML)
Deadband:			1"	
Trigger Volume:			7899 gal	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

liquid detection sensor knob keeps falling off

SHUT DOWN

Personnel: ST

Date/Time: 2/5/24 12:28

On-Site: 2/5/24 12:28

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
12:30	1.74	0.00	0.00		12.3
Downloaded to:		Stevens USB			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Lucky
 Personnel: KC, SP

Bottle 1 of 1
 Date/Time On-Site: 2/1/24 2032

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240201-03</u> , -WC
Approx Sample Volume (mL): <u>7250 ml</u>
Clarity (ex. Clear, Cloudy, Silty): <u>clear</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	2/1/24 1942	Success	13	0926	1
2	2/1/24 2007		14		
3	2039		15		
4	2059		16		
5	2114		17		
6	2130		18		
7	2148		19		
8	2209		20		
9	2242		21		
10	2/2/24 2:0104		22		
11	0502		23		
12	0734		24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle, add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

TATION: White water

SET UP

Personnel: ST, MB, TA, ST, KC

Date/Time

On-Site: 1/31/24 11:53

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
11:53	1.52	0.11	0.063	—
Enable Condition:		2.55		
Hysteresis:		1		
Flow Pulse Interval:		218.5		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time 1/31/24 11:57
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

Time off site 12:22

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 2/5/24 13:13

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
13:13	1.84	0.03	0.14	—
Downloaded to:		Sitewens USB		

On-Site

- ☐ Replace flowmeter battery
- ☐ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 2/5 13:14
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: upstream
Personnel: VC, ST

Bottle 1 of 2

Date/Time On-Site: _____

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240201-11-10-VC</u> -WC
Approx Sample Volume (mL): <u>12500</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: <u>240201-11</u> -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	1/1/24 1337	Success	13	1654	
2	1 1904		14	1713	
3	1/2/24 0028		15	1731	
4	552		16	1749	
5	1122		17	1802	
6	1513		18	1814	
7	1536		19	1826	
8	1548		20	1839	
9	1551		21	1853	
10	1610		22	1909	
11	1622		23	1930	
12	1637		24	1958	

Comments: Samples taken successfully. Timing does not make sense
Collected subsample times from flowmeter to submit to lab,
Actual begin time: 2/1/24 4:16 - 2/1/24 2346

Post storm determined FM+SA not sync'd for time during setup. ugh

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2/2/24 0004</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: VC, ST

Bottle 2 of 2
 Date/Time On-Site: 2/2/24 1040

☒ Halt Sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240201-11-</u> -WC
Approx Sample Volume (mL): <u>4500</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Tan cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: <u>-103</u> (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1	<u>2/2/24 0032</u>	<u>Success</u>	13		
2	<u>0143</u>		14		
3	<u>0338</u>		15		
4	<u>0511</u>		16		
5	<u>0602</u>		17		
6	<u>0657</u>		18		
7	<u>0736</u>		19		
8	<u>0802</u>		20		
9	<u>0823</u>		21		
10	<u>0849</u>		22		
11	<u>0922</u>		23		
12	<u>1016</u>		24		

Comments: Date/time on sampler is incorrect. Real subsample times are on the flowmeter.

Debris caught on flowmeter 2/2/24 1049

Post-storm determined Fm+SA not sync'd for time during setup. un

If sampling is complete:

- ☒ Power off sampler
- ☒ Verify flowmeter is running
- ☒ Add ice to sample transport cooler
- ☒ Complete COC form; arrange transport to lab

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: Main

SET UP

Personnel: SJ, TA, MB, ST, KC

Date/Time

On-Site: 1/31/24 13:18

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
~~13:41~~	~~1.05~~	~~10.46 gpm~~	~~0.27~~	~~12.9~~ SJ
13:45	1.06	0.00 gpm	0.00	12.9
Enable Condition or Velocity Cutoff:			0.02 SS	2.00
Deadband:			1	
Trigger Volume:			9313	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 2/5/24 1328

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1328	0.88	0.00 gpm	0.000		12.4
Downloaded to:		Stevens USB			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Main
 Personnel: ST KC

Bottle 1 of 1
 Date/Time On-Site: 2/1/24 2110

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>ST 231240201-12</u> -WC
Approx Sample Volume (mL):	<u>10250 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Silty, Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	2/1/24 1843	Success	13	0700	
2	1903		14	0720	
3	1920		15	0757	
4	1940		16		
5	2012		17		
6	2054		18		
7	2120		19		
8	2148		20		
9	2213		21		
10	2301		22		
11	2/2/24 0401		23		
12	1 0534		24		

Comments:

If sampling is complete:

- ☒ Power off sampler, if separate from flowmeter
- ☒ Keep flowmeter running
- ☒ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning
- Date/Time Restarted: _____
- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

TATION: Americana

SET UP

Personnel: ST, KC, TA, MB, SJ

Date/Time

On-Site: 1/31/24 1404

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1406	5.13	1.36	1.881	12.5
Enable Condition:		6.46		
Hysteresis:		1		
Flow Pulse Interval:		8071 c/s		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time 1/31/24 1411
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

offsite 14:40

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 2/5/24 13:55

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1356	5.58	1.54	1.885	11.82
Downloaded to:		Stevens USB		

On-Site

- ☒ Replace flowmeter battery
- ☐ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 2/5 1357
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Americana
 Personnel: ST, KC

Bottle 1 of 2
 Date/Time On-Site: 2/1/24 2123

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240201-14</u> -WC
Approx Sample Volume (mL):	<u>9500 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/1/24 1811</u>	<u>Success</u>	13	<u>2/1/24 220920</u>	
2	<u>1845</u>		14	<u>2249220</u>	
3	<u>1904 1945</u>		15	<u>2311 2242</u>	
4	<u>1921 1924</u>		16	<u>2351 2311</u>	
5	<u>1937 1921</u>		17	<u>2421 2351</u>	
6	<u>1953 1937</u>		18	<u>2421 24045</u>	
7	<u>2013 1953</u>		19		
8	<u>2038 2013</u>		20		
9	<u>2103 2038</u>		21		
10	<u>2123 2103</u>		22		
11	<u>2144 2123</u>		23		
12	<u>2022 2144</u>		24		

Comments: Accidentally turned off sampler + it restarted the program. Chose to put on new bottle since we had to start program from the beginning.

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2/2/24 101</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

STATION: Americana
 Personnel: ST. ICC

Composite Sample Collection

Bottle 2 of 2
 Date/Time On-Site: 2/2/24 0940

☒ Halt sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240201-14-WC</u> ^{KC} -WC
Approx Sample Volume (mL):	<u>5000mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Tan</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/2/24 0233</u>	<u>Success</u>	13		
2	<u>0334</u>		14		
3	<u>0423</u>		15		
4	<u>0457</u>		16		
5	<u>0538</u>		17		
6	<u>0627</u>		18		
7	<u>0702</u>		19		
8	<u>0724</u>		20		
9	<u>0746</u>		21		
10	<u>0812</u>		22		
11	<u>0848</u>		23		
12	<u>0936</u>		24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: AS_6

SET UP

Personnel: SJ, TAMM, ST, KL

Date/Time

On-Site: 1/31/24 1454

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1503	0.0	0.0	0.0	12.4
Enable Condition or Velocity Cutoff:			0.02	
Deadband:			1	
Trigger Volume:			6.02 601cf	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments: Time off site: 1512

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 2/6/24 0941

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
0943	0.000	0.00	0.00	88302	11.3
Downloaded to:			Rugged6		

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: AS-6
 Personnel: KC, ST

Bottle 1 of 2

Date/Time On-Site: _____

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240201-206</u> -WC
Approx Sample Volume (mL): <u>19400</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	21/24 1846	Rinse error	13	21/24 2209	Success
2	1909	Success	14	2225	
3	1922		15	2244	
4	1934		16	2308	
5	1946		17	2353	diagnostic error
6	2000		18		
7	2016		19		
8	2039		20		
9	2104		21		
10	2124		22		
11	2141		23		
12	2155		24		

Comments: Bottle completely full to rim. New bottle installed & program restarted.

If sampling is complete:

- ☐ Power off sampler, if separate from flowmeter
- ☐ Keep flowmeter running
- ☐ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle, add ice
- ☒ Restart program from beginning

Date/Time Restarted: 21/24 0635

- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

15"

Composite Sample Collection

STATION: AS-6
 Personnel: KC, ST

Bottle 2 of 2
 Date/Time On-Site: 2/2/24 1005

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240201-206</u> -WC
Approx Sample Volume (mL): <u>5000 ml</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/2/24 0835</u>	<u>Success</u>	13		
2	<u>0904</u>		14		
3	<u>0554</u>		15		
4	<u>0606</u>		16		
5	<u>0729</u>		17		
6	<u>0751</u>		18		
7	<u>0812</u>		19		
8	<u>0839</u>		20		
9	<u>0936</u>		21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Attachment D: Storm Event Analytical Reports

Report Date: 02/12/2024 16:32



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00327-01	ACST1B	240201-03-WG	Water		02/01/2024	02/02/2024
AC00327-02	ACST1B	240201-03-101	Water		02/01/2024	02/02/2024
AC00327-03	ACST1B	240201-03-001	Water		02/01/2024	02/02/2024
AC00327-04	ACST1B	240201-11-WG	Water		02/01/2024	02/02/2024
AC00327-05	ACST1B	240201-12-WG	Water		02/01/2024	02/02/2024
AC00327-06	ACST1B	240201-14-WG	Water		02/01/2024	02/02/2024
AC00327-07	ACST1B	240201-206-WG	Water		02/01/2024	02/02/2024

Report Date: 02/12/2024 16:32



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 18:25
Lab Number: AC00327-01
Sample Type: Grab

Location Description: 240201-03-WG
Sample Collector: T.A
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst		
				MDL *	MDL				Reference	Initials	Qualifier
Microbiology											
E. Coli	B240390	<1.0MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/02/24 06:23	2/3/24 8:23	MEC	H U	
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod	02/02/24	2/2/24 7:05	LRF		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 02/12/2024 16:32



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 12:00
Lab Number: AC00327-02
Sample Type: Grab

Location Description: 240201-03-101
Sample Collector: T.A
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst		
				MDL *	MDL				Initials	Qualifier	
Microbiology											
E. Coli	B240390	2.0MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/02/24 07:23	2/3/24 8:23	MEC	H	
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod	02/02/24	2/2/24 7:18	LRF		

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Report Date: 02/12/2024 16:32



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Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 12:00
Lab Number: AC00327-03
Sample Type: Grab

Location Description: 240201-03-001
Sample Collector: T.A
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method		Prepared	Analyzed	Analyst	
				MDL *	MDL	Reference				Initials	Qualifier
Microbiology											
E. Coli	B240390	<1.0MPN/100 mL		1.0	1.0	IDEXX - Colilert		02/02/24 07:23	2/3/24 8:23	MEC	H U
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod		02/02/24	2/2/24 7:18	LRF	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 02/12/2024 16:32



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Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 18:59
Lab Number: AC00327-04
Sample Type: Grab

Location Description: 240201-11-WG
Sample Collector: C.S
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst		
				MDL *	MDL				Initials	Qualifier	
Microbiology											
E. Coli	B240390	68.9MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/02/24 06:34	2/3/24 8:23	MEC	H	
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod	02/02/24	2/2/24 7:09	LRF		

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Report Date: 02/12/2024 16:32



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Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 18:15
Lab Number: AC00327-05
Sample Type: Grab

Location Description: 240201-12-WG
Sample Collector: K.C
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst		
				MDL *	MDL				Initials	Qualifier	
Microbiology											
E. Coli	B240390	238.2 MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/02/24 06:10	2/3/24 8:23	MEC	H	
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod	02/02/24	2/2/24 7:05	LRF		

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Report Date: 02/12/2024 16:32



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Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 18:41
Lab Number: AC00327-06
Sample Type: Grab

Location Description: 240201-14-WG
Sample Collector: M.B
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst		
				MDL *	MDL				Initials	Qualifier	
Microbiology											
E. Coli	B240390	65.0MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/02/24 06:28	2/3/24 8:23	MEC	H	
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod	02/02/24	2/2/24 7:05	LRF		

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Report Date: 02/12/2024 16:32



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Analysis Report

Location: ACST1B
Date/Time Collected: 02/01/2024 19:06
Lab Number: AC00327-07
Sample Type: Grab

Location Description: 240201-206-WG
Sample Collector: K.C
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst		
				MDL *	MDL				Reference	Initials	Qualifier
Microbiology											
E. Coli	B240390	290.9 MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/02/24 06:58	2/3/24 8:23	MEC	H	
Wet Chemistry											
Chlorine Screen	B240392	Absent				SM 4500-CL G-2000 mod	02/02/24	2/2/24 7:09	LRF		

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Report Date: 02/12/2024 16:32



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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B240390									
Blank (B240390-BLK1)									
E. Coli	Absent						02/03/2024	MEC	
LCS (B240390-BS1)									
E. Coli				Present			02/03/2024	MEC	
Duplicate (B240390-DUP1) Source ID: AC00327-07									
E. Coli					Pass	128	02/03/2024	MEC	



Notes and Definitions

Item	Definition
H	Hold time Exceeded.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:

63065628

Project: Stormwater-PI

Sampler(s):

Kristen Chisholm
Chad Schwend
Tim Anderson
Michael Bule

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coll - IDEXX Colliert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
AC00327																								
-01	2/1/24		1825		240201-03-WG	TA	X	X										X						1
-02	2/1/24		1200		240201-03-101	TA	X	X										X						1
-03	2/1/24		1200		240201-03-001	TA	X	X										X						1
-04	2/1/24		1859		240201-11- ~~400~~ WG	CS	X	X										X						1
-05	2/1/24		1815		240201-12-WG	KC	X	X										X						1
-06	2/1/24		1841		240201-14-WG	MB	X	X										X						1
-07	2/1/24		1906		240201-206-WG	KC	X	X										X						1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Kristen Chisholm</i>	2/1/2024 1957	<i>Chad Schwend</i> 2/1/24 1957	
<i>Chad Schwend</i>	2/1/2024 2032	<i>Tim Anderson</i> 2-2-24 0601	

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00329-01	ACST1C	240201-12-WC	Water		02/02/2024	02/02/2024
AC00329-02	ACST1C	240201-14-WC	Water		02/02/2024	02/02/2024
AC00329-03	ACST1C	240201-206-WC	Water		02/02/2024	02/02/2024
AC00329-04	ACST1C	240201-03-WC	Water		02/02/2024	02/02/2024
AC00329-05	ACST1C	240201-11-WC	Water		02/02/2024	02/02/2024
AC00329-06	ACST1C	240201-11-103	Water		02/02/2024	02/02/2024

Revised Report



Boise City Public Works
Water Quality Laboratory
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Analysis Report

Location: ACST1C

Location Description: 240201-12-WC

Date/Time Collected: 02/01/2024 18:43 - 02/02/2024 07:57

Lab Number: AC00329-01

Sample Collector: S.T

Sample Type: Composite

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240477	351		35.0	35.0	SM 4500-NH3 D-2011	02/09/24	2/9/24 9:02	ALN	
BOD5	B240404	5.74	mg/L	2.00	2.00	SM 5210 B-2016	02/03/24	2/8/24 9:58	ASE	
Chloride	B240518	12.7	mg/L	0.0800	0.0800	EPA 300.0, Rev. 2.1 (1993)	02/12/24	2/12/24 17:58	BAK	
COD	B240401	77.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/03/24	2/3/24 10:18	RKT	
Nitrate-Nitrite, as N	B240479	0.209	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/09/24	2/9/24 11:13	RKT	
TKN	B240548	1.12	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	02/15/24	2/16/24 9:56	JAL	
Total Dissolved Solids	B240407	64.2	mg/L	20.0	20.0	SM 2540 C-2015	02/02/24	2/6/24 11:51	ASE	
Total Suspended Solids	B240408	59.8	mg/L	0.900	0.900	SM 2540 D-2015	02/04/24	2/4/24 12:48	CLH	
Turbidity	B240400	103	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/02/24	2/2/24 13:26	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240398	0.0557	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:25	RKT	
Total Metals										
Mercury	B240440	0.0112	ug/L	0.0100	0.0100	EPA 245.1	02/07/24	2/8/24 8:20	SAS	
Arsenic	B240405	1.4	ug/L	0.070	0.070	EPA 200.8	02/04/24	2/8/24 13:37	DMW	
Cadmium	B240405	0.066	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:37	DMW	
Calcium	B240429	4.17	mg/L	0.0400	0.0400	EPA 200.7	02/06/24	2/8/24 11:51	AMO	
Lead	B240405	4.1	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:37	DMW	
Magnesium	B240429	1930	ug/L	80.0	80.0	EPA 200.7	02/06/24	2/8/24 11:51	AMO	
Phosphorus as P	B240429	0.143	mg/L	0.0120	0.0120	EPA 200.7	02/06/24	2/8/24 11:51	AMO	
Hardness	B240429	18.3	mg/L	0.100	0.100	SM 2340 B-2011	02/06/24	2/8/24 11:51	AMO	
Dissolved Metals										
Cadmium	B240406	0.012	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/4/24 14:36	DMW	
Copper	B240406	3.6	ug/L	0.15	0.15	EPA 200.8	02/04/24	2/4/24 14:36	DMW	
Lead	B240406	0.084	ug/L	9.00E-3	9.00E-3	EPA 200.8	02/04/24	2/4/24 14:36	DMW	
Zinc	B240406	18.4	ug/L	0.50	0.50	EPA 200.8	02/04/24	2/4/24 14:36	DMW	

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Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
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Analysis Report

Location: ACST1C

Location Description: 240201-14-WC

Date/Time Collected: 02/01/2024 18:11 - 02/02/2024 09:36

Lab Number: AC00329-02

Sample Collector: S.T

Sample Type: Composite

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240477	193		35.0	35.0	SM 4500-NH3 D-2011	02/09/24	2/9/24 9:10	ALN	
BOD5	B240404	6.98	mg/L	2.00	2.00	SM 5210 B-2016	02/03/24	2/8/24 9:52	ASE	
Chloride	B240518	64.1	mg/L	0.0800	0.0800	EPA 300.0, Rev. 2.1 (1993)	02/12/24	2/12/24 18:24	BAK	
COD	B240401	55.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/03/24	2/3/24 10:18	RKT	
Nitrate-Nitrite, as N	B240479	0.905	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/09/24	2/9/24 11:14	RKT	
TKN	B240548	1.05	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	02/15/24	2/16/24 10:01	JAL	
Total Dissolved Solids	B240407	224	mg/L	20.0	20.0	SM 2540 C-2015	02/02/24	2/6/24 11:52	ASE	
Total Suspended Solids	B240408	50.7	mg/L	0.900	0.900	SM 2540 D-2015	02/04/24	2/4/24 12:04	CLH	
Turbidity	B240400	89.6	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/02/24	2/2/24 13:47	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240398	0.116	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:26	RKT	
Total Metals										
Mercury	B240440	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	02/07/24	2/8/24 8:23	SAS	U
Arsenic	B240405	3.4	ug/L	0.070	0.070	EPA 200.8	02/04/24	2/8/24 13:47	DMW	
Cadmium	B240405	0.063	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:47	DMW	
Calcium	B240429	27.3	mg/L	0.0400	0.0400	EPA 200.7	02/06/24	2/8/24 11:54	AMO	
Lead	B240405	4.2	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:47	DMW	
Magnesium	B240429	6070	ug/L	80.0	80.0	EPA 200.7	02/06/24	2/8/24 11:54	AMO	
Phosphorus as P	B240429	0.213	mg/L	0.0120	0.0120	EPA 200.7	02/06/24	2/8/24 11:54	AMO	
Hardness	B240429	93.3	mg/L	0.100	0.100	SM 2340 B-2011	02/06/24	2/8/24 11:54	AMO	
Dissolved Metals										
Cadmium	B240406	0.016	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/4/24 14:39	DMW	
Copper	B240406	3.4	ug/L	0.15	0.15	EPA 200.8	02/04/24	2/4/24 14:39	DMW	
Lead	B240406	0.090	ug/L	9.00E-3	9.00E-3	EPA 200.8	02/04/24	2/4/24 14:39	DMW	
Zinc	B240406	17.3	ug/L	0.50	0.50	EPA 200.8	02/04/24	2/4/24 14:39	DMW	

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Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C
Date/Time Collected: 02/01/2024 19:09 - 02/02/2024 09:36
Lab Number: AC00329-03
Sample Type: Composite

Location Description: 240201-206-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240477	159		35.0	35.0	SM 4500-NH3 D-2011	02/09/24	2/9/24 9:08	ALN	
BOD5	B240404	11.6	mg/L	2.00	2.00	SM 5210 B-2016	02/03/24	2/8/24 9:47	ASE	
Chloride	B240518	14.5	mg/L	0.0800	0.0800	EPA 300.0, Rev. 2.1 (1993)	02/12/24	2/12/24 19:17	BAK	
COD	B240401	108	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/03/24	2/3/24 10:18	RKT	
Nitrate-Nitrite, as N	B240479	0.191	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/09/24	2/9/24 11:15	RKT	
TKN	B240548	1.83	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	02/15/24	2/16/24 10:02	JAL	
Total Dissolved Solids	B240407	116	mg/L	20.0	20.0	SM 2540 C-2015	02/02/24	2/6/24 11:53	ASE	
Total Suspended Solids	B240408	70.3	mg/L	0.900	0.900	SM 2540 D-2015	02/04/24	2/4/24 12:49	CLH	
Turbidity	B240400	143	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:01	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240398	0.285	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:27	RKT	
Total Metals										
Mercury	B240440	0.0168	ug/L	0.0100	0.0100	EPA 245.1	02/07/24	2/8/24 8:27	SAS	
Arsenic	B240405	3.0	ug/L	0.070	0.070	EPA 200.8	02/04/24	2/8/24 13:50	DMW	
Cadmium	B240405	0.077	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:50	DMW	
Calcium	B240429	3.33	mg/L	0.0400	0.0400	EPA 200.7	02/06/24	2/8/24 11:57	AMO	
Lead	B240405	6.7	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:50	DMW	
Magnesium	B240429	2060	ug/L	80.0	80.0	EPA 200.7	02/06/24	2/8/24 11:57	AMO	
Phosphorus as P	B240429	0.464	mg/L	0.0120	0.0120	EPA 200.7	02/06/24	2/8/24 11:57	AMO	
Hardness	B240429	16.8	mg/L	0.100	0.100	SM 2340 B-2011	02/06/24	2/8/24 11:57	AMO	
Dissolved Metals										
Cadmium	B240406	0.013	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/4/24 14:48	DMW	
Copper	B240406	4.5	ug/L	0.15	0.15	EPA 200.8	02/04/24	2/4/24 14:48	DMW	
Lead	B240406	0.29	ug/L	9.00E-3	9.00E-3	EPA 200.8	02/04/24	2/4/24 14:48	DMW	
Zinc	B240406	10.5	ug/L	0.50	0.50	EPA 200.8	02/04/24	2/4/24 14:48	DMW	

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Revised Report



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11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C

Location Description: 240201-03-WC

Date/Time Collected: 02/01/2024 19:42 - 02/02/2024 09:26

Lab Number: AC00329-04

Sample Collector: S.T

Sample Type: Composite

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240477	173		35.0	35.0	SM 4500-NH3 D-2011	02/09/24	2/9/24 9:05	ALN	
BOD5	B240404	7.27	mg/L	2.00	2.00	SM 5210 B-2016	02/03/24	2/8/24 9:43	ASE	
Chloride	B240518	6.25	mg/L	0.0800	0.0800	EPA 300.0, Rev. 2.1 (1993)	02/12/24	2/12/24 19:43	BAK	
COD	B240401	39.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/03/24	2/3/24 10:18	RKT	
Nitrate-Nitrite, as N	B240479	0.204	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/09/24	2/9/24 11:16	RKT	
TKN	B240548	0.894	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	02/15/24	2/16/24 10:03	JAL	
Total Dissolved Solids	B240407	52.8	mg/L	20.0	20.0	SM 2540 C-2015	02/04/24	2/6/24 11:55	ASE	
Total Suspended Solids	B240408	18.8	mg/L	0.900	0.900	SM 2540 D-2015	02/04/24	2/4/24 13:41	CLH	
Turbidity	B240400	60.5	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/02/24	2/2/24 13:33	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240398	0.100	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:28	RKT	
Total Metals										
Mercury	B240440	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	02/07/24	2/8/24 7:41	SAS	U
Arsenic	B240405	0.85	ug/L	0.070	0.070	EPA 200.8	02/04/24	2/8/24 13:52	DMW	
Cadmium	B240405	0.024	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:52	DMW	
Calcium	B240429	4.01	mg/L	0.0400	0.0400	EPA 200.7	02/06/24	2/8/24 12:00	AMO	
Lead	B240405	0.82	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:52	DMW	
Magnesium	B240429	1460	ug/L	80.0	80.0	EPA 200.7	02/06/24	2/8/24 12:00	AMO	
Phosphorus as P	B240429	0.174	mg/L	0.0120	0.0120	EPA 200.7	02/06/24	2/8/24 12:00	AMO	
Hardness	B240429	16.0	mg/L	0.100	0.100	SM 2340 B-2011	02/06/24	2/8/24 12:00	AMO	
Dissolved Metals										
Cadmium	B240406	<0.0100	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/4/24 14:51	DMW	U
Copper	B240406	2.0	ug/L	0.15	0.15	EPA 200.8	02/04/24	2/4/24 14:51	DMW	
Lead	B240406	0.056	ug/L	9.00E-3	9.00E-3	EPA 200.8	02/04/24	2/4/24 14:51	DMW	
Zinc	B240406	17.5	ug/L	0.50	0.50	EPA 200.8	02/04/24	2/4/24 14:51	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B, was corrected for dilution, dry weight, or method-defined ML.

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
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Analysis Report

Location: ACST1C

Location Description: 240201-11-WC

Date/Time Collected: 02/01/2024 04:16 - 02/02/2024 10:16

Lab Number: AC00329-05

Sample Collector: S.T

Sample Type: Composite

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240477	169		35.0	35.0	SM 4500-NH3 D-2011	02/09/24	2/9/24 9:39	ALN	
BOD5	B240404	9.34	mg/L	2.00	2.00	SM 5210 B-2016	02/03/24	2/8/24 9:37	ASE	
Chloride	B240518	35.6	mg/L	0.0800	0.0800	EPA 300.0, Rev. 2.1 (1993)	02/12/24	2/12/24 20:10	BAK	
COD	B240401	82.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/03/24	2/3/24 10:18	RKT	
Nitrate-Nitrite, as N	B240479	0.375	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/09/24	2/9/24 11:17	RKT	
TKN	B240548	1.33	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	02/15/24	2/16/24 10:04	JAL	
Total Dissolved Solids	B240407	139	mg/L	20.0	20.0	SM 2540 C-2015	02/02/24	2/6/24 11:56	ASE	
Total Suspended Solids	B240408	58.4	mg/L	0.900	0.900	SM 2540 D-2015	02/04/24	2/4/24 12:51	CLH	
Turbidity	B240400	106	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:08	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240398	0.171	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:30	RKT	
Total Metals										
Mercury	B240440	0.0148	ug/L	0.0100	0.0100	EPA 245.1	02/07/24	2/8/24 8:30	SAS	
Arsenic	B240405	2.4	ug/L	0.070	0.070	EPA 200.8	02/04/24	2/8/24 13:54	DMW	
Cadmium	B240405	0.058	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:54	DMW	
Calcium	B240429	10.0	mg/L	0.0400	0.0400	EPA 200.7	02/06/24	2/8/24 12:03	AMO	
Lead	B240405	4.8	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:54	DMW	
Magnesium	B240429	4370	ug/L	80.0	80.0	EPA 200.7	02/06/24	2/8/24 12:03	AMO	
Phosphorus as P	B240429	0.321	mg/L	0.0120	0.0120	EPA 200.7	02/06/24	2/8/24 12:03	AMO	
Hardness	B240429	43.0	mg/L	0.100	0.100	SM 2340 B-2011	02/06/24	2/8/24 12:03	AMO	
Dissolved Metals										
Cadmium	B240406	<0.0100	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/4/24 14:53	DMW	U
Copper	B240406	3.9	ug/L	0.15	0.15	EPA 200.8	02/04/24	2/4/24 14:53	DMW	
Lead	B240406	0.18	ug/L	9.00E-3	9.00E-3	EPA 200.8	02/04/24	2/4/24 14:53	DMW	
Zinc	B240406	25.7	ug/L	0.50	0.50	EPA 200.8	02/04/24	2/4/24 14:53	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App B, was corrected for dilution, dry weight, or method-defined ML.

Revised Report



Boise City Public Works
Water Quality Laboratory
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Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C
Date/Time Collected: 02/02/2024 04:16 - 02/02/2024 10:16
Lab Number: AC00329-06
Sample Type: Composite

Location Description: 240201-11-103
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240477	170		35.0	35.0	SM 4500-NH3 D-2011	02/09/24	2/9/24 9:36	ALN	
BOD5	B240404	8.90	mg/L	2.00	2.00	SM 5210 B-2016	02/03/24	2/8/24 9:34	ASE	
Chloride	B240518	35.6	mg/L	0.0800	0.0800	EPA 300.0, Rev. 2.1 (1993)	02/12/24	2/12/24 20:36	BAK	
COD	B240401	83.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/03/24	2/3/24 10:18	RKT	
Nitrate-Nitrite, as N	B240479	0.378	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/09/24	2/9/24 11:19	RKT	
TKN	B240548	1.35	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	02/15/24	2/16/24 10:06	JAL	
Total Dissolved Solids	B240407	140	mg/L	20.0	20.0	SM 2540 C-2015	02/02/24	2/6/24 11:57	ASE	
Total Suspended Solids	B240408	53.8	mg/L	0.900	0.900	SM 2540 D-2015	02/04/24	2/4/24 12:48	CLH	
Turbidity	B240400	113	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:16	LRF	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240398	0.172	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/02/24	2/2/24 14:31	RKT	
Total Metals										
Mercury	B240440	0.0127	ug/L	0.0100	0.0100	EPA 245.1	02/07/24	2/8/24 8:34	SAS	
Arsenic	B240405	2.4	ug/L	0.070	0.070	EPA 200.8	02/04/24	2/8/24 13:57	DMW	
Cadmium	B240405	0.052	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:57	DMW	
Calcium	B240429	9.88	mg/L	0.0400	0.0400	EPA 200.7	02/06/24	2/8/24 12:06	AMO	
Lead	B240405	4.9	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/8/24 13:57	DMW	
Magnesium	B240429	4290	ug/L	80.0	80.0	EPA 200.7	02/06/24	2/8/24 12:06	AMO	
Phosphorus as P	B240429	0.312	mg/L	0.0120	0.0120	EPA 200.7	02/06/24	2/8/24 12:06	AMO	
Hardness	B240429	42.4	mg/L	0.100	0.100	SM 2340 B-2011	02/06/24	2/8/24 12:06	AMO	
Dissolved Metals										
Cadmium	B240406	0.011	ug/L	0.010	0.010	EPA 200.8	02/04/24	2/4/24 14:56	DMW	
Copper	B240406	3.7	ug/L	0.15	0.15	EPA 200.8	02/04/24	2/4/24 14:56	DMW	
Lead	B240406	0.19	ug/L	9.00E-3	9.00E-3	EPA 200.8	02/04/24	2/4/24 14:56	DMW	
Zinc	B240406	26.6	ug/L	0.50	0.50	EPA 200.8	02/04/24	2/4/24 14:56	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Revised Report



Boise City Public Works
Water Quality Laboratory
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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B240400									
Blank (B240400-BLK1)									
Turbidity	<0.3	NTU					02/02/2024	LRF	U
LCS (B240400-BS1)									
Turbidity			99.5	90-110			02/02/2024	LRF	
Duplicate (B240400-DUP1)	Source ID: AC00329-02								
Turbidity					9.90	25	02/02/2024	LRF	D
Batch: B240401									
Blank (B240401-BLK1)									
COD	<7	mg/L					02/03/2024	RKT	U
LCS (B240401-BS1)									
COD			95.7	90-110			02/03/2024	RKT	
Duplicate (B240401-DUP1)	Source ID: AC00330-01								
COD					0.00	10	02/03/2024	RKT	
Batch: B240404									
Blank (B240404-BLK1)									
BOD5	<2	mg/L					02/08/2024	ASE	U
LCS (B240404-BS1)									
BOD5			107	84.6-115.4			02/08/2024	ASE	
LCS (B240404-BS2)									
BOD5			100	84.6-115.4			02/08/2024	ASE	
Duplicate (B240404-DUP1)	Source ID: BB03562-02								
BOD5					3.49	30	02/08/2024	ASE	D
Batch: B240407									
Blank (B240407-BLK1)									
Total Dissolved Solids	<20	mg/L					02/06/2024	ASE	U
LCS (B240407-BS1)									
Total Dissolved Solids			92.4	90-110			02/06/2024	ASE	
Duplicate (B240407-DUP1)	Source ID: AC00330-01								
Total Dissolved Solids					1.35	10	02/06/2024	ASE	

Revised Report



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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240408									
Blank (B240408-BLK1)									
Total Suspended Solids	<0.9	mg/L					02/04/2024	CLH	U
LCS (B240408-BS1)									
Total Suspended Solids			97.1	90-110			02/04/2024	CLH	
Duplicate (B240408-DUP1) Source ID: AC00330-01									
Total Suspended Solids					5.76	20	02/04/2024	CLH	
Duplicate (B240408-DUP2) Source ID: BB03562-01									
Total Suspended Solids					3.48	20	02/04/2024	CLH	
Batch: B240477									
Blank (B240477-BLK1)									
Ammonia, as N	<35	ug/L					02/09/2024	ALN	U
Blank (B240477-BLK2)									
Ammonia, as N	<35	ug/L					02/09/2024	ALN	U
LCS (B240477-BS1)									
Ammonia, as N			101	90-110			02/09/2024	ALN	
LCS (B240477-BS2)									
Ammonia, as N			103	90-110			02/09/2024	ALN	
Duplicate (B240477-DUP1) Source ID: BB03559-02									
Ammonia, as N					1.51	10	02/09/2024	ALN	
Duplicate (B240477-DUP2) Source ID: LS01853-02									
Ammonia, as N					0.108	10	02/09/2024	ALN	
Duplicate (B240477-DUP3) Source ID: BB03578-01									
Ammonia, as N					0.524	10	02/09/2024	ALN	
Duplicate (B240477-DUP4) Source ID: BB03570-04									
Ammonia, as N					0.00	10	02/09/2024	ALN	
Matrix Spike (B240477-MS1) Source ID: BB03559-02									
Ammonia, as N			106	80-120			02/09/2024	ALN	
Matrix Spike (B240477-MS2) Source ID: LS01853-02									
Ammonia, as N			106	80-120			02/09/2024	ALN	
Matrix Spike (B240477-MS3) Source ID: BB03578-01									
Ammonia, as N			103	80-120			02/09/2024	ALN	
Matrix Spike (B240477-MS4) Source ID: BB03570-04									
Ammonia, as N			102	80-120			02/09/2024	ALN	
Matrix Spike Dup (B240477-MSD1) Source ID: BB03559-02									
Ammonia, as N			104	80-120	1.15	10	02/09/2024	ALN	
Matrix Spike Dup (B240477-MSD2) Source ID: LS01853-02									
Ammonia, as N			107	80-120	0.685	10	02/09/2024	ALN	
Matrix Spike Dup (B240477-MSD3) Source ID: BB03578-01									
Ammonia, as N			106	80-120	2.14	10	02/09/2024	ALN	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240477 (Continued)									
Matrix Spike Dup (B240477-MSD4) Ammonia, as N	Source ID: BB03570-04		103	80-120	0.553	10	02/09/2024	ALN	
Batch: B240479									
Blank (B240479-BLK1) Nitrate-Nitrite, as N	<0.025	mg/L					02/09/2024	RKT	U
Blank (B240479-BLK2) Nitrate-Nitrite, as N	<0.025	mg/L					02/09/2024	RKT	U
Blank (B240479-BLK3) Nitrate-Nitrite, as N	<0.025	mg/L					02/09/2024	RKT	U
LCS (B240479-BS1) Nitrate-Nitrite, as N			99.7	90-110			02/09/2024	RKT	
LCS (B240479-BS2) Nitrate-Nitrite, as N			98.9	90-110			02/09/2024	RKT	
LCS (B240479-BS3) Nitrate-Nitrite, as N			97.7	90-110			02/09/2024	RKT	
Duplicate (B240479-DUP1) Nitrate-Nitrite, as N	Source ID: BB03548-02RE1				NR	10	02/09/2024	RKT	
Duplicate (B240479-DUP2) Nitrate-Nitrite, as N	Source ID: BB03578-04				2.93	10	02/09/2024	RKT	
Duplicate (B240479-DUP3) Nitrate-Nitrite, as N	Source ID: LS01856-02				0.191	10	02/09/2024	RKT	
Duplicate (B240479-DUP4) Nitrate-Nitrite, as N	Source ID: WB02951-06				0.252	10	02/09/2024	RKT	
Duplicate (B240479-DUP5) Nitrate-Nitrite, as N	Source ID: BB03584-01				0.814	10	02/09/2024	RKT	
Matrix Spike (B240479-MS1) Nitrate-Nitrite, as N	Source ID: BB03548-02RE1		99.2	90-110			02/09/2024	RKT	
Matrix Spike (B240479-MS2) Nitrate-Nitrite, as N	Source ID: BB03578-04		95.4	90-110			02/09/2024	RKT	
Matrix Spike (B240479-MS3) Nitrate-Nitrite, as N	Source ID: LS01856-02		96.4	90-110			02/09/2024	RKT	
Matrix Spike (B240479-MS4) Nitrate-Nitrite, as N	Source ID: WB02951-06		96.5	90-110			02/09/2024	RKT	
Matrix Spike (B240479-MS5) Nitrate-Nitrite, as N	Source ID: BB03584-01		98.3	90-110			02/09/2024	RKT	
Matrix Spike Dup (B240479-MSD1) Nitrate-Nitrite, as N	Source ID: BB03548-02RE1		97.8	90-110	1.46	10	02/09/2024	RKT	
Matrix Spike Dup (B240479-MSD2) Nitrate-Nitrite, as N	Source ID: BB03578-04		94.6	90-110	0.730	10	02/09/2024	RKT	

Revised Report



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Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240479 (Continued)									
Matrix Spike Dup (B240479-MSD3) Nitrate-Nitrite, as N	Source ID: LS01856-02		98.1	90-110	0.886	10	02/09/2024	RKT	
Matrix Spike Dup (B240479-MSD4) Nitrate-Nitrite, as N	Source ID: WB02951-06		96.3	90-110	0.0725	10	02/09/2024	RKT	
Matrix Spike Dup (B240479-MSD5) Nitrate-Nitrite, as N	Source ID: BB03584-01		98.4	90-110	0.0649	10	02/09/2024	RKT	
Batch: B240518									
Blank (B240518-BLK1) Chloride	<0.08	mg/L					02/12/2024	BAK	U
Blank (B240518-BLK2) Chloride	<0.08	mg/L					02/13/2024	BAK	U
LCS (B240518-BS1) Chloride			97.6	90-110			02/12/2024	BAK	
LCS (B240518-BS2) Chloride			98.1	90-110			02/13/2024	BAK	
LCS (B240518-BS3) Chloride			97.6	90-110			02/12/2024	BAK	
Duplicate (B240518-DUP1) Chloride	Source ID: LS01859-01				0.0260	10	02/12/2024	BAK	
Duplicate (B240518-DUP2) Chloride	Source ID: ES00298-02				0.0302	10	02/13/2024	BAK	
Duplicate (B240518-DUP3) Chloride	Source ID: LS01859-01RE1				0.0989	10	02/13/2024	BAK	D
Matrix Spike (B240518-MS1) Chloride	Source ID: LS01859-01		93.6	90-110			02/12/2024	BAK	
Matrix Spike (B240518-MS2) Chloride	Source ID: ES00298-02		96.1	90-110			02/13/2024	BAK	
Matrix Spike (B240518-MS3) Chloride	Source ID: LS01859-01RE1		97.1	90-110			02/13/2024	BAK	D
Matrix Spike (B240518-MS4) Chloride	Source ID: AC00329-02		94.4	90-110			02/12/2024	BAK	
Matrix Spike (B240518-MS5) Chloride	Source ID: AC00329-02		94.8	90-110			02/13/2024	BAK	
Matrix Spike (B240518-MS6) Chloride	Source ID: WQ00200-05		95.5	90-110			02/13/2024	BAK	
Matrix Spike Dup (B240518-MSD1) Chloride	Source ID: LS01859-01		94.0	90-110	0.127	10	02/12/2024	BAK	
Matrix Spike Dup (B240518-MSD2) Chloride	Source ID: ES00298-02		95.7	90-110	0.192	10	02/13/2024	BAK	

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240518 (Continued)									
Matrix Spike Dup (B240518-MSD3) Chloride			Source ID: LS01859-01RE1 98.0	90-110	0.388	10	02/13/2024	BAK	D
Batch: B240548									
Blank (B240548-BLK1) TKN	<0.1	mg/L					02/16/2024	JAL	U
Blank (B240548-BLK2) TKN	<0.1	mg/L					02/16/2024	JAL	U
Blank (B240548-BLK3) TKN	<0.1	mg/L					02/16/2024	JAL	U
LCS (B240548-BS1) TKN			100	80-120			02/16/2024	JAL	
LCS (B240548-BS2) TKN			106	80-120			02/16/2024	JAL	
LCS (B240548-BS3) TKN			94.4	80-120			02/16/2024	JAL	
Duplicate (B240548-DUP1) TKN			Source ID: AC00329-01		0.415	20	02/16/2024	JAL	
Duplicate (B240548-DUP2) TKN			Source ID: BB03570-01		2.83	20	02/16/2024	JAL	D
Duplicate (B240548-DUP3) TKN			Source ID: BB03578-03		1.87	20	02/16/2024	JAL	D
Duplicate (B240548-DUP4) TKN			Source ID: LS01856-05		5.74	20	02/16/2024	JAL	D
Matrix Spike (B240548-MS1) TKN			Source ID: AC00329-01 99.7	80-120			02/16/2024	JAL	
Matrix Spike (B240548-MS2) TKN			Source ID: BB03570-01 99.2	80-120			02/16/2024	JAL	D
Matrix Spike (B240548-MS3) TKN			Source ID: BB03578-03 102	80-120			02/16/2024	JAL	D
Matrix Spike (B240548-MS4) TKN			Source ID: LS01856-05 86.1	80-120			02/16/2024	JAL	D
Matrix Spike (B240548-MS5) TKN			Source ID: WQ00200-03 97.5	80-120			02/16/2024	JAL	
Matrix Spike (B240548-MS6) TKN			Source ID: WQ00200-04 94.9	80-120			02/16/2024	JAL	
Matrix Spike Dup (B240548-MSD1) TKN			Source ID: AC00329-01 101	80-120	1.39	20	02/16/2024	JAL	
Matrix Spike Dup (B240548-MSD2) TKN			Source ID: BB03570-01 99.6	80-120	0.237	20	02/16/2024	JAL	D

Revised Report



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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240548 (Continued)									
Matrix Spike Dup (B240548-MSD3) TKN	Source ID: BB03578-03		104	80-120	0.657	20	02/16/2024	JAL	D
Matrix Spike Dup (B240548-MSD4) TKN	Source ID: LS01856-05		92.5	80-120	2.57	20	02/16/2024	JAL	D
Dissolved Wet Chemistry									
Batch: B240398									
Blank (B240398-BLK1) Orthophosphate, as P	<0.003	mg/L					02/02/2024	RKT	U
LCS (B240398-BS1) Orthophosphate, as P			98.7	90-110			02/02/2024	RKT	
Duplicate (B240398-DUP1) Orthophosphate, as P	Source ID: WB02944-06				0.461	10	02/02/2024	RKT	D
Duplicate (B240398-DUP2) Orthophosphate, as P	Source ID: LS01852-02				0.270	10	02/02/2024	RKT	D
Matrix Spike (B240398-MS1) Orthophosphate, as P	Source ID: WB02944-06		103	90-110			02/02/2024	RKT	D
Matrix Spike (B240398-MS2) Orthophosphate, as P	Source ID: LS01852-02		102	90-110			02/02/2024	RKT	D
Matrix Spike Dup (B240398-MSD1) Orthophosphate, as P	Source ID: WB02944-06		102	90-110	0.249	10	02/02/2024	RKT	D
Matrix Spike Dup (B240398-MSD2) Orthophosphate, as P	Source ID: LS01852-02		102	90-110	0.0492	10	02/02/2024	RKT	D

Revised Report



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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B240405									
Blank (B240405-BLK1)									
Arsenic	<0.070	ug/L					02/08/2024	DMW	U
Cadmium	<0.010	ug/L					02/08/2024	DMW	U
Lead	<0.010	ug/L					02/08/2024	DMW	U
LCS (B240405-BS1)									
Arsenic			101	85-115			02/08/2024	DMW	
Cadmium			101	85-115			02/08/2024	DMW	
Lead			102	85-115			02/08/2024	DMW	
Duplicate (B240405-DUP1) Source ID: AC00329-01									
Arsenic					2.22	20	02/08/2024	DMW	
Cadmium					2.34	20	02/08/2024	DMW	
Lead					2.48	20	02/08/2024	DMW	
Matrix Spike (B240405-MS1) Source ID: AC00329-01									
Arsenic			97.6	70-130			02/08/2024	DMW	
Cadmium			100	70-130			02/08/2024	DMW	
Lead			101	70-130			02/08/2024	DMW	
Matrix Spike Dup (B240405-MSD1) Source ID: AC00329-01									
Arsenic			98.3	70-130	0.625	20	02/08/2024	DMW	
Cadmium			101	70-130	0.665	20	02/08/2024	DMW	
Lead			101	70-130	0.234	20	02/08/2024	DMW	
Batch: B240429									
Blank (B240429-BLK1)									
Calcium	<0.04	mg/L					02/08/2024	AMO	U
Magnesium	<80	ug/L					02/08/2024	AMO	U
Phosphorus as P	<0.012	mg/L					02/08/2024	AMO	U
LCS (B240429-BS1)									
Calcium			102	85-115			02/08/2024	AMO	
Magnesium			103	85-115			02/08/2024	AMO	
Phosphorus as P			101	85-115			02/08/2024	AMO	
Duplicate (B240429-DUP1) Source ID: AC00330-01									
Calcium					1.74	20	02/08/2024	AMO	
Magnesium					1.98	20	02/08/2024	AMO	
Phosphorus as P					0.174	20	02/08/2024	AMO	
Matrix Spike (B240429-MS1) Source ID: AC00330-01									
Calcium			102	70-130			02/08/2024	AMO	
Magnesium			102	70-130			02/08/2024	AMO	
Phosphorus as P			101	70-130			02/08/2024	AMO	
Matrix Spike Dup (B240429-MSD1) Source ID: AC00330-01									
Calcium			102	70-130	0.0523	20	02/08/2024	AMO	
Magnesium			102	70-130	0.188	20	02/08/2024	AMO	
Phosphorus as P			102	70-130	0.474	20	02/08/2024	AMO	

Revised Report



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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B240440									
Blank (B240440-BLK1)									
Mercury	<0.01	ug/L					02/08/2024	SAS	U
LCS (B240440-BS1)									
Mercury			103	85-115			02/08/2024	SAS	
Duplicate (B240440-DUP1) Source ID: AC00329-04									
Mercury					NR	20	02/08/2024	SAS	U
Matrix Spike (B240440-MS1) Source ID: AC00329-04									
Mercury			106	70-130			02/08/2024	SAS	
Matrix Spike Dup (B240440-MSD1) Source ID: AC00329-04									
Mercury			109	70-130	2.55	20	02/08/2024	SAS	
Dissolved Metals									
Batch: B240406									
Blank (B240406-BLK1)									
Cadmium	<0.010	ug/L					02/04/2024	DMW	U
Copper	<0.15	ug/L					02/04/2024	DMW	U
Lead	<0.0090	ug/L					02/04/2024	DMW	U
Zinc	<0.50	ug/L					02/04/2024	DMW	U
LCS (B240406-BS1)									
Cadmium			103	85-115			02/04/2024	DMW	
Copper			97.2	85-115			02/04/2024	DMW	
Lead			102	85-115			02/04/2024	DMW	
Zinc			98.7	85-115			02/04/2024	DMW	
Duplicate (B240406-DUP1) Source ID: AC00329-02									
Cadmium					14.8	10	02/04/2024	DMW	QC-02
Copper					0.197	10	02/04/2024	DMW	
Lead					1.65	10	02/04/2024	DMW	
Zinc					1.45	10	02/04/2024	DMW	
Matrix Spike (B240406-MS1) Source ID: AC00329-02									
Cadmium			100	70-130			02/04/2024	DMW	
Copper			92.7	70-130			02/04/2024	DMW	
Lead			97.8	70-130			02/04/2024	DMW	
Zinc			94.2	70-130			02/04/2024	DMW	
Matrix Spike Dup (B240406-MSD1) Source ID: AC00329-02									
Cadmium			99.4	70-130	0.723	10	02/04/2024	DMW	
Copper			93.3	70-130	0.456	10	02/04/2024	DMW	
Lead			99.7	70-130	1.89	10	02/04/2024	DMW	
Zinc			96.0	70-130	1.20	10	02/04/2024	DMW	

Revised Report



Boise City Public Works
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Notes and Definitions

Item	Definition
D	Data reported from a dilution
QC-02	The RPD is greater than the method acceptance criteria. At least one of the values used to calculate the RPD, is less than or equal to the PQL.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order: 6
Project: S
Sampler(s): K

Stormwater-PI

Kristen Chisholm
Stacey Turner

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
	2/1/24 1019		
	2/2/24 1101	 2-2-24 1102	

AC00329

ACD2379^{WY24}

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418

Tel. (208) 387-6269

Fax (208) 387-6391

Purchase Order:

63065628

Project:

Stormwater-PI

Sampler(s):

Steven Turner
Kristin Chickah

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	~~F-Cali-DEX-Gottfert Chlorides~~	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
AC00329																								
-03	2/2/24	2/2/24	0335	0936	240201-206-WC	ST	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Kristin Chickah</i>	2/2/24 1019	<i>OK Jai</i>	
<i>Be Jai</i>	2/2/24 1102	<i>Apurba Jyoti</i> 2-2-24 1102	

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628

Stormwater-PI

Kristin Chisholm
Steve Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colitag Chlorides	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Contaminants
AC00329																								
-04	2/1/24	2/2/24	1342	0926	240201-03-WC	ST	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-05	2/2/24	2/2/24	0416	1016	240201-11-WC	ST	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
-06					240201-11-103 (Dup)																			

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristin Chisholm	2/2/2024 1134	Steve Turner	If sufficient volume, please split 240201-11-WC for a duplicate analysis under the name 240201-11-103.
Steve Turner	2/2/2024 1159	April B. [Signature]	If low volume for 240201-03-WC, prioritize dissolved parameters, then any other parameters you can, please.

Modified

Ada County Highway District

Attn: Steven Turner
 3775 Adams Street
 Garden City, Idaho 83714-6418
 Tel. (208) 387-6269
 Fax (208) 387-6391
 Purchase Order:
 Project:
 Sampler(s):

63065628
 Stormwater-PI
 Steven Turner
 Kristin Chisholm

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix		Type		Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	~~EPA 200.1~~ <i>Chlorides</i>	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
							Water		Grab																		
AC00329																											
-03	2/1/24	2/2/24	0335	0936	240201-206-WC	ST	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
	2/1/24		1909	0936																							

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Kristin Chisholm</i>	2/2/24 1019	<i>OS</i>	
<i>OS</i>	2/2/24 1102	<i>Opulde</i> 2-2-24 1102	

Modified

Ada County Highway District

Attn: Steven Turner
 3775 Adams Street
 Garden City, Idaho 83714-6418
 Tel. (208) 387-6269
 Fax (208) 387-6391
 Purchase Order:
 Project:
 Sampler(s):

63065628
 Stormwater-PI
 Kristina Chisholm
 Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	
AC00329							Water	Grab	Composite
									BOD ₅ - SM 5210 B COD - Hach 8000 TSS - SM 2540 D TDS - SM 2540 C TKN - EPA 351.2 TP - EPA 200.7 Orthophosphate - EPA 365.1 Total As, Cd, Pb - EPA 200.8 Diss. Cd Cu, Pb, Zn - EPA 200.8 Total Hg - EPA 245.2 E-Coli - IDEXX - Coliform Chlorides Turbidity - EPA 180.1 Hardness - EPA 200.7 NO ₃ +NO ₂ - EPA 353.2 NH ₃ - SM 4500 NH ₃ -D Total Contaminants
-04	2/11/24	2/2/24	1342	0926	240201-03-WC	ST	X	X	X X X X X X X X X X X X X X
-05	2/11/24	2/2/24	0416	1016	240201-11-WC	ST	X	X	X X X X X X X X X X X X X X
-06					240201-11-103 (Dup)				

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristina Chisholm	2/2/2024 1134	Steven Turner	If sufficient volume, please split 240201-11-WC for a duplicate analysis under the name 240201-11-103.
Steven Turner	2/2/2024 1159	April 11/59	If low volume for 240201-03-WC, prioritize dissolved parameters, then any other parameters you can, please.

Azubike Emenari

To: Steven Turner; Stephen Quintero
Cc: Monica Lowe
Subject: RE: [External] RE: 2/2/24 Lab Report Issue

From: Steven Turner <sturner@achdidaho.org>
Sent: Wednesday, March 13, 2024 1:50 PM
To: Azubike Emenari <AEmenari@cityofboise.org>; Stephen Quintero <SQuintero@cityofboise.org>
Cc: Monica Lowe <mlowe@achdidaho.org>
Subject: [External] RE: 2/2/24 Lab Report Issue

Caution: This email came from outside the city. Use caution before clicking on links, opening attachments, or responding.

Hey lab folks,

Apologies asking for more changes to the 2/1/24 storm, but we noticed a few additional times that needed to be changed to the analysis report. Here is also a [rewritten chain of custody](#).

The following samples need their times adjusted:

- AC00329-03 begin time is 19:09 on 2/1/24 (previously written as 2/2/2024 3:35)
- AC00329-05 begin time is 4:16 on 2/1/24 (previously written as 2/2/2024 04:16)

It's not a big deal if these changes can't be made but let me know when we can expect this document to be sent over.

Again, sorry for the changes. We really appreciate all you do.

Best,
Steven Turner
Environmental Specialist | Environmental Department

Ada County Highway District (ACHD)
3775 Adams Street, Garden City, Idaho 83714
Phone: (208)407-4284
www.achdidaho.org
Connect with us on social! [@achdidaho](#)



From: Steven Turner
Sent: Tuesday, March 12, 2024 2:17 PM

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 1 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: <u>AC00329-01</u> Location: <u>ACSTIC</u> Sample Date: 2-2-24 Sample ID: <u>240201-</u> <u>1</u> <u>12-WC</u>	Split Date: 2-2-24 Start Split: <u>1111</u> Start Filter: <u>1111</u> Comp Time: <u>N/A</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-capacity ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>Not Avail.</u> Comp Jug: <u>N/A</u> SS Tubing/Helper: CC00047-43 (SSA1) Stir Bar: CC00048-85 Connector: CC00035-68 and CC00041-31	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	<u>only 1 jug</u>
Lims#: <u>AC00329-02</u> Location: <u>ACSTIC</u> Sample Date: 2-2-24 Sample ID: <u>240201-</u> <u>2</u> <u>14-WC</u>	Split Date: 2-2-24 Start Split: <u>1125</u> Start Filter: <u>1125</u> Comp Time: <u>1121</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45 high-capacity ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00048-77</u> Comp Jug: <u>CC00048-77</u> SS Tubing/Helper: CC00047-85 (SSA4) Stir Bar: CC00048-85 Connector: CC00040-06 and CC00039-71	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	<u>composited into (1) of the 16L</u>
Lims#: <u>AC00329-03</u> Location: <u>ACSTIC</u> Sample Date: 2-2-24 Sample ID: <u>240201-</u> <u>3</u> <u>206-WC</u>	Split Date: 2-2-24 Start Split: <u>1142</u> Start Filter: <u>1142</u> Comp Time: <u>1138</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-capacity (x3) ☒ 5.0µm (x2) ☒ 10.0µm (x2)	Coll Jug: <u>CC00047-32</u> Comp Jug: <u>CC00048-86</u> SS Tubing/Helper: CC00048-70 (SSA5) Stir Bar: CC00048-85 Connector: CC00041-46 (x2) <u>CC00048-69</u>	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	<u>initially used 3 Voss filters, but plugged after 500mL waste, used another (4) Voss filters; was able to get needed volume then.</u>
Lims#: <u>AC00329-05</u> Location: <u>ACSTIC</u> Sample Date: 2-2-24 Sample ID: <u>240201-</u> <u>4</u> <u>11-WC</u>	Split Date: 2-2-24 Start Split: <u>1220</u> Start Filter: <u>1220</u> Comp Time: <u>1215</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-capacity ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00048-78 (x2)</u> Comp Jug: <u>CC00048-78</u> SS Tubing/Helper: CC00047-42 (SSA6) Stir Bar: CC00050-10 Connector: CC00041-46 (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	<u>composited into 40L Round</u>
Lims#: <u>AC00329-06</u> Location: <u>ACSTIC</u> Sample Date: 2-2-24 Sample ID: <u>240201-</u> <u>5 BLP</u> <u>11-WC</u> <u>103</u>	Split Date: 2-2-24 Start Split: <u>1135</u> Start Filter: <u>1135</u> Comp Time: <u>1215</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-capacity ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00048-78 (x2)</u> Comp Jug: <u>CC00048-78</u> SS Tubing/Helper: CC00047-18 (SSA7) Stir Bar: <u>CC00034-BB (Dr)</u> Connector: CC00044-99 (x2)	☒ Teflon Total ☒ TKN ☒ Teflon Diss (F) ☒ NH ₃ ☒ Hg CVAA ☒ NO _x (F) ☒ BOD ☒ ortho-P (F) ☒ TSS ☒ Turb ☒ TDS ☐ ☒ COD ☐	<u>Duplicate</u>

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 2 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: <u>A000329-04</u> Location: <u>ACSTIC</u> Sample Date: <u>2-2-24</u> Sample ID: <u>Amd/DKT</u> <u>240201-03-WC</u> <u>6</u>	Split Date: <u>2-2-24</u> Start Split: <u>1252</u> Start Filter: <u>1252</u> Comp Time: <u>N/A</u> Analyst: <u>Amd/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-capacity ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00048-77</u> Comp Jug: <u>N/A</u> SS Tubing/Helper: <u>CC00048-70 (SSAB)</u> Stir Bar: <u>CC00040-97</u> Connector: <u>CC00044-99 (x2)</u>	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☐ ☐	<u>Only 1 jug</u>
Lims#: <u>A000330-01</u> <u>A000329-04</u> Location: <u>ACSTIC</u> Sample Date: <u>2-2-24</u> Sample ID: <u>240201-18-WC</u> <u>7</u>	Split Date: <u>2-2-24</u> Start Split: <u>1315</u> Start Filter: <u>1315</u> Comp Time: <u>1312</u> Analyst: <u>Amd/DKT</u>	Filter: ☒ Voss ☒ 0.45µm ^{high-capacity} ☐ 1.0µm ☒ 5.0µm ☒ Other: <u>10.0µm</u>	Coll Jug: <u>CC00048-78 (x2)</u> Comp Jug: <u>CC00048-78</u> SS Tubing: <u>SS17</u> SS Helper: <u>CC00050-08</u> Stir Bar: <u>CC00034-B3</u> Connector: <u>CC00044-99</u> <u>CC00048-69</u>	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☐ ☐	<u>2nd jug had low volume and was noticeably lighter in color</u>
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD (F) ☒ TSS ☒ TDS ☐ ☐ ☐ ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P ☒ Turb ☐ ☐	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☐ ☐	
Lims#: _____ Location: _____ Sample Date: _____ Sample ID: _____	Split Date: _____ Start Split: _____ Start Filter: _____ Comp Time: _____ Analyst: _____	Filter: ☒ Voss ☒ 0.45µm ☐ 1.0µm ☒ 5.0µm ☐ Other: _____	Coll Jug: _____ Comp Jug: _____ SS Tubing: _____ SS Helper: _____ Stir Bar: _____ Connector: _____	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☐ ☐	



Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 801.316.9859

Prepared for: Ada County Highway District

Project Title: NPDES Phase I Stormwater Support WY 2024

Project No.: 159103

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for February 26, 2024

Date: May 24, 2024

To: Monica Lowe

Cc: Steven Turner

Kristen Chisholm

From: Zuly Lapa, Project Engineer

Prepared by: Zuly Lapa, EIT, Project Engineer

Reviewed by: Melissa Jannusch, PE, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 10, 2023. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The Environmental Protection Agency Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES Permit), effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2024 (October 1, 2023, through September 30, 2024). The following storm event report summarizes stormwater sampling results from the February 26, 2024, storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2024 Phase I Stormwater Outfall Monitoring. When samples are qualified, additional samples will be attempted from subsequent storms to collect unqualified samples.

Table 2-1. WY 2024 Samples Collected					
Date	Lucky	Whitewater	Main	Americana	AS_6
October 10, 2023	G, C ^{1,2}	G	--	G, C ³	--
November 19, 2023	G, C	G, C	G, C	G ⁴ , C	G, C
February 1, 2024	G ⁵ , C	G ⁵ , C ⁶	G ⁵ , C	G ⁵ , C	G ⁵ , C
February 26, 2024	G, C	G, C	G, C ⁷	G, C	G, C
Unqualified Samples:	3G, 3C	3G, 2C	2G, 2C	2G, 3C	2G, 3C
Samples Remaining:	0G, 0C	0G, 1C	1G, 1C	1G, 0C	1G, 0C

Notes:

-- = no samples taken

C = composite sample

G = grab sample

¹ Composite samples qualified due to lack of representativeness (50% – 75%).

² Incomplete water quality analysis due to low composite sample volume.

³ Composite samples qualified due to lack of representativeness (50% – 75%) of the calculated flow volume.

⁴ Incomplete field parameter collection on the grab sample data form due to field error.

⁵ E. coli sample qualified due to exceeded hold time.

⁶ Composite sample rejected due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented more than 10% of the composite volume.

⁷ Composite sample qualified due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented less than 10% of the composite volume.

Section 3: Storm Event Summary

The February 26, 2024, storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A summary of the forecast on which monitoring decisions were based is detailed below. The sampling event communication form that describes the forecast and summarizes the decision-making process from February 26, 2024, is included in Attachment A for reference.

Saturday, February 24, 2024 (Sampling Event Communication)

- On the afternoon of February 24, the National Weather Service issued a forecast for widespread rain in the Boise area, starting February 26 at 0400 and ending at 1500, with the heaviest precipitation from 1000 to 1300. The chance of precipitation was 90%, with 0.30 inches of precipitation forecasted.

Sunday, February 25, 2024 (Set Up)

- Setup was accomplished in the morning of February 25. An expected precipitation depth of 0.11 inches was used to set trigger volumes at monitoring stations. A runoff calculations worksheet showing how the trigger volumes were calculated is included in Attachment A.

Monday, February 26, 2024 (Storm Event)

- Moderate rain first started at approximately February 26 at 0821 and ended at 1241. A stronger second wave of rain started soon after around 1230 and ended at 2032.
- Precipitation totals ranged between 0.13 and 0.21 inches at local rain gauges.

Flow measurements and precipitation data are listed in Table 1 along with a sampling summary. Hydrographs for the Lucky, Whitewater, Main, Americana and AS_6 site showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Lucky, Whitewater, Main, Americana and AS_6 monitoring stations were set up on February 25, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programmed into the Whitewater and Americana flowmeters. A site-specific velocity cutoff value was programmed into Lucky, Main, and AS_6 flowmeter. Setup and sampling information are included in Table 1. The field forms completed during setup/shutdown and sampling are included in Attachment C.

Grab Samples

Two, two-member teams mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on February 26 around 0910. Grab samples for Lucky, Whitewater, Main, Americana, and AS_6 were submitted to the West Boise Water Quality Lab (WQL) at 1201 on February 26.

Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment D.

Composite Samples

Composite samples were collected at the Lucky, Whitewater, Main, and Americana monitoring station and submitted to the WQL at 2057 on February 26. The composite sample at AS_6 monitoring station was submitted at 2058 on February 26 to the WQL.

Analytical results are shown in Table 2 and pollutant loading estimates for the event are detailed in Table 3. Laboratory analytical reports are included in Attachment D.



Section 4: Quality Assurance/Quality Control

A summary of quality control samples collected during the February 26, 2024, storm event is presented below in Table 4-1. A field blank and a field duplicate were collected from the Main monitoring station. The analytical results for these samples are included in Table 4.

Table 4-1. Quality Control Samples			
Sample ID	Sample Type	Parent Sample	Conclusions
240226-12-001	Field blank	Main grab	No <i>E. coli</i> detection was reported in the field blank.
240226-12-101	Field duplicate	Main grab	Relative percent difference was within the acceptable range.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A.

An acceptable composite sample represents at least 75 percent of the total discharge or at least 6 hours of the storm duration. All composite samples, except for Main, met the criteria.

Prior to the start of the storm precipitation or runoff, three subsamples were successfully collected by the automatic sampler at the Main monitoring site. These subsamples are considered non-stormwater, as there was no evidence of flow or precipitation during the evening of February 25th through the morning of February 26th. Following the SWOMP guidelines, calculations were conducted to determine if the non-stormwater composite subsamples volume accounted for 10% of the total composite sample volume. The non-stormwater composite subsamples accounted for 8% of the total composite sample volume (see Table 4-2), qualifying the Main composite sample.

Table 4-2. Non-Stormwater Subsample Evaluation		
Composite Sample Volume (ft ³)	Non-Stormwater Subsample Volume (ft ³)	Non-stormwater Subsample Ratio
11,165	913	8 %

Section 5: Notes and Recommendations

Main

The Main site collected non-stormwater samples at three instances prior to the sampling event. The samples had levels greater than the enabling condition of 1.87-inches. The sampler was programmed correctly at the time of set-up. Additional investigation is required to determine the cause of collecting samples when there was no evidence of flow or precipitation. ACHD will reach out to HACH for support.

Americana

Two “Skipped” sample messages were recorded during the composite sample collection at Americana. These sample messages appear when the sampling team pause the sampler program, stopping it from collecting the next subsample. The “Skipped” sample messages do not affect the sampling data nor is shown on the hydrograph.

Data Tables



TAB-1

Table 1. Sampling and Flow Summary					
	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	YES	YES	YES	YES	YES
Composite samples collected and submitted?	YES	YES	YES	YES	YES
Trigger volume (gal or ft ³)	2895 gal	800 ft ³	3411 gal	2960 ft ³	137 ft ³
Velocity cutoff (fps)	--	--	--	--	0.02
Sampler enable condition (in)	Level > 2.72 "	Level > 3.05 "	Level > 1.87 "	Level > 7.59 "	--
Runoff start time	0839	0848	0834	0821	0915
Grab sample collection time	1017	0928	0919	0948	1012
Composite sample stop time	1534	1908	1601	1606	1620
Runoff stop time	1752	2032	1733	1752	1759
Volume of Discharge Sampled (ft ³)	3,573	30,558	11,165 ¹	115,368	4,873
Volume of non-stormwater subsamples (ft ³)	--	--	913	--	--
Total runoff volume (ft ³)	3,965	35,198	10,885	140,004	5,447
Percent of storm flow sampled (%)	90%	87%	103% ¹	83%	89%
Percent of non-stormwater volume to total discharge sampled volume (%)	--	--	8%	--	--
Composite sample duration (hrs)	6.5	9.5	17 ¹	7	6
Storm Precipitation (in)	0.13	0.21	0.18	0.18/0.18	0.18/0.18
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	10	40	26	35	24
Number of composite bottles filled	1	2	2	2	2
Composite sample volume (Approx.; ml)	5,000 ml	23,500 ml	14,050 ml	20,500 ml	13,000 ml

Notes:

-- = No data.

¹ Non stormwater samples were collected prior to the start of the storm precipitation or runoff

Table 2. Field and Analytical Data Summary																											
Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				E. coli mpn/100 mL	Sample ID Composite	Analytical Parameters																		
			Dissolved Oxygen	pH	Conductivity	Temperature			BOD ₅	COD	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C			mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	2/26/2024	240226-03-WG	9.89	8.27	125.9	4.75	37.9	240226-03-WC	13.5	60.0	53.2	18.9	18.1	114	0.262	0.124	0.476	0.969	1.71	2.6	0.011	0.031	4.5	0.028	0.72	0.0150	13.5
Whitewater	2/26/2024	240226-11-WG	10.88	7.74	749.2	5.97	38.3	240226-11-WC	12.6	84.0	77.8	52.3	47.3	182	0.347	0.174	0.596	0.921	2.43	2.6	0.014	0.062	4.4	0.093	3.8	0.0151	24.5
Main	2/26/2024	240226-12-WG	9.79	7.94	165.88	9.53	24.3	240226-12-WC	13.9	119 ⁵¹	29.8 ⁵¹	94.7 ⁵¹	104 ⁵¹	85.2 ⁵¹	0.231 ⁵¹	0.0631 ⁵¹	0.829 ⁵¹	0.424 ⁵¹	1.96 ⁵¹	1.5 ⁵¹	0.032 ⁵¹	0.13 ⁵¹	5.6 ⁵¹	0.12 ⁵¹	6.1 ⁵¹	0.0191 ⁵¹	51.7 ⁵¹
Americana	2/26/2024	240226-14-WG	10.54	7.53	470.55	8.74	125.9	240226-14-WC	12.6	85.0	102	51.1	54.3	214	0.276	0.106	0.496	0.940	1.47	3.3	0.021	0.097	4.0	0.063	3.9	0.0148	24.3
AS_6	2/26/2024	240226-206-WG	9.39	7.44	124.28	6.49	53.7	240226-206-WC	17.7	122	22.2	75.5	75.8	85.8	0.570	0.289	0.522	0.278	2.43	2.2	0.016	0.087	5.0	0.26	6.3	0.0183	20.2

Notes:
 - = No data.
⁵¹ Composite sample qualified due to non stormwater sample volume comprising less than 10% of the total composite sample volume

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
Lucky	2/26/2024	4.48	0.0648	0.118	0.240	0.423
Whitewater	2/26/2024	104	0.762	1.31	2.02	5.34
Main	2/26/2024	70.6 ^{5J}	0.157 ^{5J}	0.563 ^{5J}	0.288 ^{5J}	1.33 ^{5J}
Americana	2/26/2024	474	2.41	4.33	8.21	12.8
AS_6	2/26/2024	25.8	0.194	0.177	0.0945	0.826

Notes:

^{5J} Composite sample qualified due to non stormwater sample volume comprising less than 10% of the total composite sample volume

Table 4. QC Sample Summary				
Date	Parent Sample	Sample ID	Type	E. coli
				mpn/ 100 mL
2/26/2024	240226-12-WG	240226-12-001	Field Blank	<1.0
2/26/2024	240226-12-WG	240226-12-101	Field Duplicate	26.9
Calculated parent/duplicate RPD				2%
Allowable RPD				40%

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 02/24/2024	Time: 8:24 AM	Initials: ST
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Yes

Past 72 hr Precip	
Date and time of expected event	Monday, 2/26/24 @4:00 AM
Expected amount of precipitation	0.30"
Percent chance of precipitation	90%
Percent chance of >0.10" over 12 hours	75%

NWS Update

Spoke with Les from NWS and he thinks Boise will still get 0.3" of rain starting at 4:00 AM – 3:00 PM on Monday. It will be a heaviest around 10:00 AM – 1:00 PM.

<u>Targeted Station & Samples</u>					
Lucky	Whitewater	Main	Americana	AS_6	State (Phase II)
☒ Grab	☒ Grab	☒ Grab	☒ Grab	☒ Grab	☒ Grab
☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite	☒ Composite

Type of Forecasted Precipitation

☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☐ Thunder Showers	☐ Snowmelt
☐ Other:		

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday

☐ Waiting on Antecedent Dry Period – Expires:

☐ Equipment Concerns:

☐ Other:

Text Forecast

NWS Forecast for: 2 Miles NNW Garden City ID
 Issued by: National Weather Service Boise, ID
 Last Update: 4:08 am MST Feb 24, 2024

Today: Sunny, with a high near 60. South southeast wind 5 to 7 mph.
 Tonight: Clear, with a low around 35. Southeast wind around 6 mph.
 Sunday: Sunny, with a high near 62. Southeast wind 6 to 10 mph.
 Sunday Night: A 20 percent chance of rain after 11pm. Increasing clouds, with a low around 41. South wind 6 to 10 mph.

Monday: Rain. High near 48. Breezy, with a south southwest wind 11 to 16 mph becoming west 18 to 23 mph in the morning. Winds could gust as high as 36 mph. Chance of precipitation is 90%. New precipitation amounts between a tenth and quarter of an inch possible.

Monday Night: A 20 percent chance of snow before 11pm. Mostly cloudy, with a low around 27. Blustery.
 Tuesday: Partly sunny, with a high near 43.
 Tuesday Night: A 20 percent chance of snow after 11pm. Mostly cloudy, with a low around 30.
 Wednesday: A slight chance of rain and snow before 11am, then a chance of rain. Mostly cloudy, with a high near 50. Chance of precipitation is 30%.
 Wednesday Night: A 30 percent chance of rain. Mostly cloudy, with a low around 40.

Thursday: A 40 percent chance of rain. Mostly cloudy, with a high near 57.
Thursday Night: Rain likely. Mostly cloudy, with a low around 38. Chance of precipitation is 60%.
Friday: Rain likely. Mostly cloudy, with a high near 54. Chance of precipitation is 70%.

Forecast Discussion

[Area Forecast Discussion](#)

National Weather Service Boise ID
354 AM MST [Sat](#) Feb 24 2024

.SHORT TERM...Today through Monday night...Sunny, mild and dry conditions today will give way to increasing clouds on Sunday. Most areas will see high temperatures around 10 degrees above [normal](#) both days, but below records. Snow covered mountain valleys won't quite achieve the anomalous warmth, but will still warm above [normal](#). Light precipitation will develop over the w-central Idaho mountains Sunday afternoon as a storm drops out of Canada. Given the mild [air mass](#) snow levels will start between 5-6kft, meaning rain in mountain valleys. The precipitation expands across the higher terrain in e-central Oregon and Boise mountains Sunday night. By sunrise Monday morning snow levels will range between 4500-5500 feet bringing a change from rain to snow in mountain valleys. It's during the day Monday that we'll see the heaviest snowfall rates in the mountains and rain fill in across the valleys as the upper [trough](#) and accompanying cold [front](#) drop through the region. At elevations above 5500-6000 feet, where it's all snow, accumulations of 6-12 inches are possible with locally higher amounts. Have less confidence on accumulation in mountain valleys as snow will have to overcome recent mild temperatures and daytime [insolation](#) along with temperatures above freezing. For now will keep the WS [Watch](#) headline.

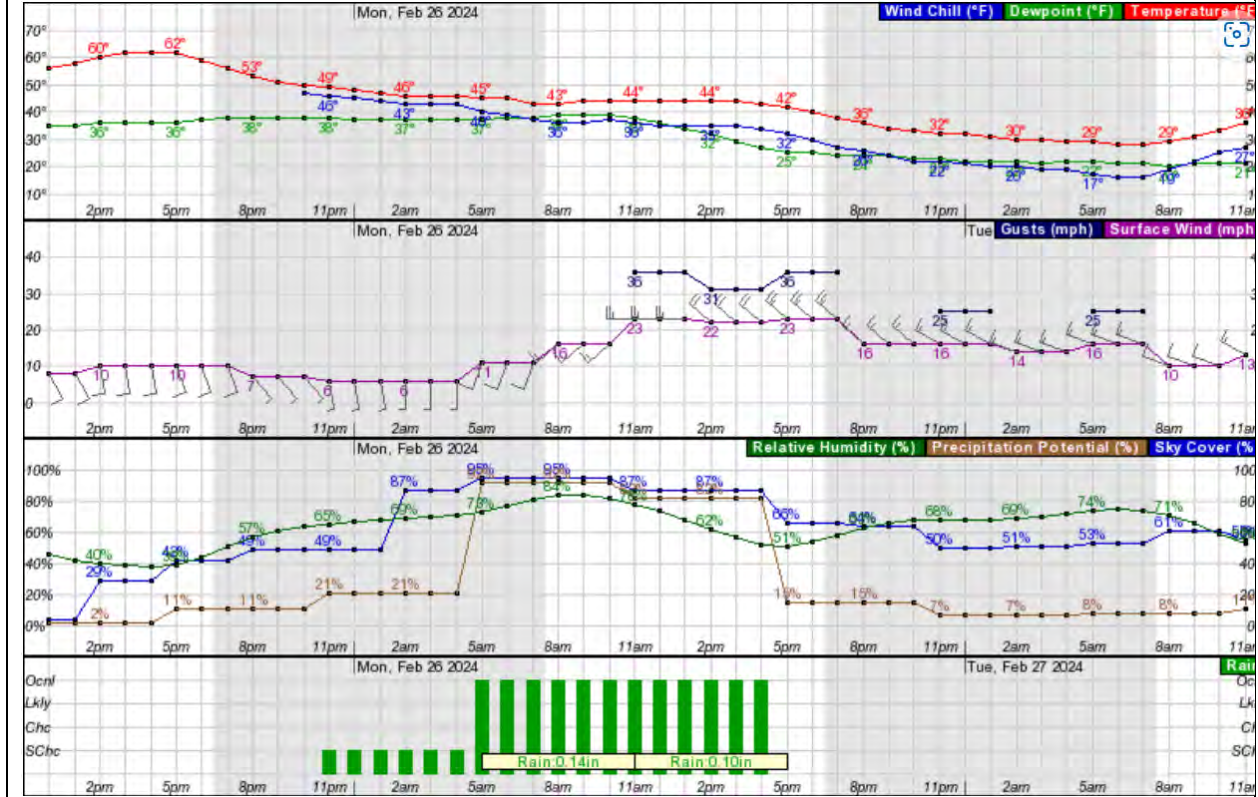
Strong [flow](#) aloft, 25-40 mph at ~5kft [MSL](#) and 45-60 mph at ~10kft [MSL](#), and a tightening surface pressure [gradient](#) will translate to gusty winds across the region. Elevated and open terrain will see the strongest winds as [flow](#) aloft mixes to the surface. This includes Harney and Malheur counties in Oregon and areas outside of the lower Snake Plain in SW Idaho. A high Wind [Watch](#) remains in place across southern and western zones as forecast speeds are solid Advisory and possible [Warning](#) magnitude. This is especially the case for areas closer to the NV border. The lower Snake Plain will see winds ramp up with the frontal passage Monday afternoon and Advisory winds are still in play.

Precipitation will shut off quickly behind the [front](#) Monday afternoon/evening as snow levels drop to valley floors. Sites below 4000 feet will [likely](#) see precipitation end as rain. In the Snake Plain the best chance to see a change to snow will be east of Mountain Home, and more so in the western Magic Valley where minor accumulations are forecast. Snow showers will continue in the mountains Monday night with light additional accumulation.

.LONG TERM...Tuesday through Saturday...As quickly as the [trough](#) entered the region, it's on the way out on Tuesday. Lower elevations dry out while [instability](#) supports continuation of showers across the mountains. Any accumulation will be light. By Wednesday, westerly [flow](#) off the Pacific will begin to moderate the [air mass](#), raising snow levels to 4500-5500 feet. Mountains will continue to see precipitation through the end of the week as a [deepening trough](#) along the [Pac](#) NW coast maintains a steady

and moist [flow](#) aloft. Lower elevations will see precipitation chances increase again toward the end of the week as the [trough](#) shifts inland. After Thursday, snow levels will gradually lower in response to the advancing [trough](#).

Hourly Forecast



Storm Event QA/QC Checklist – Phase I

STORM DATE 2/26/24

A. Event and Data Completeness	Yes	No	N/A	Notes					
1. Field data sheets filled out completely and clearly	X								
2. Field parameters reviewed, and any problems/issues addressed	X								
3. All samples collected as specified	X								
4. All samples delivered to lab promptly (review chain of custody rpts)	X			See ^{3T} analytical reports for noted sample container temp.					
5. Inconsistencies/clarifications discussed with sampling team member			X						
6. All analytical reports from lab received	X			Reissued to report ammonia in mg/L					
B. Validation and Verification Methods	Yes	No	N/A	Notes					
1. Outliers and unexpected values discussed with lab			X						
2. Appropriate analytical methods used	X			Verified correct ammonia method + units					
3. All lab QA samples were within method acceptance criteria	X								
4. All samples reviewed and data qualifiers assigned if needed	X								
5. Data quality objective achieved	X								
C. Specific Storm and Sample QA/QC Criteria	Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)	0.00	0.00	0.00	0.00	0.00	< 0.11" in 72 hrs	X		
2. Precipitation (inches)	0.13	0.21	0.18	0.18/0.19	0.18/0.18	> 0.10"	X		
3. Sampled amount (% of total run-off)	90%	87%	95%	83%	89%	>= 75% or >= 6 hrs: no qualifier >= 50% and <75%: qualify < 50%: reject	X		
4. Composite sample duration (hours)	6.5	9.5	17.0	7.0	6.0	<= 8 hrs: no qualifier >8 and <=16 hrs.: qualify >16 hrs.: reject	X		
4. Ecoli sample holding time (hours)	3.0	4.0	4.0	3.5	3.0	<= 24 hrs: no qualifier > 24 hrs.: reject	X		
5. Filtering of samples for dissolved parameter analysis (hours)	16.0	12.5	16.5	16.0	16.0	<= 24 hrs: no qualifier > 24 hrs.: reject	X		

D. Notes

Reviewed by Heum Turner Date 4/11/24

Approved by Monica Lowe Date 4/11/24

Storm Runoff Estimates and Trigger Volumes

Step 1. Enter runoff coefficients in yellow cells.

Step 2. Enter expected precipitation depth (in) in blue cell.

Step 3. Read trigger volumes (**bold**) in green cells.

Expected Precipitation Depth = 0.11
 Aliquots per Sample = 17

Site	Area (ac)	Using RC calculated from flow data		
		RC	Expected Vol (ft ³)	Trigger Vol (ft ³)
Lucky	105	0.157	6582.5	387
Whitewater	498	0.069	13621.3	801
Main	79	0.246	7760.0	456
Main Alt	60	0.200	4791.6	282
Americana	875	0.144	50311.8	2960
AS_6	204	0.046	3747.0	220
State	34	0.160	2172.2	128

Notes:

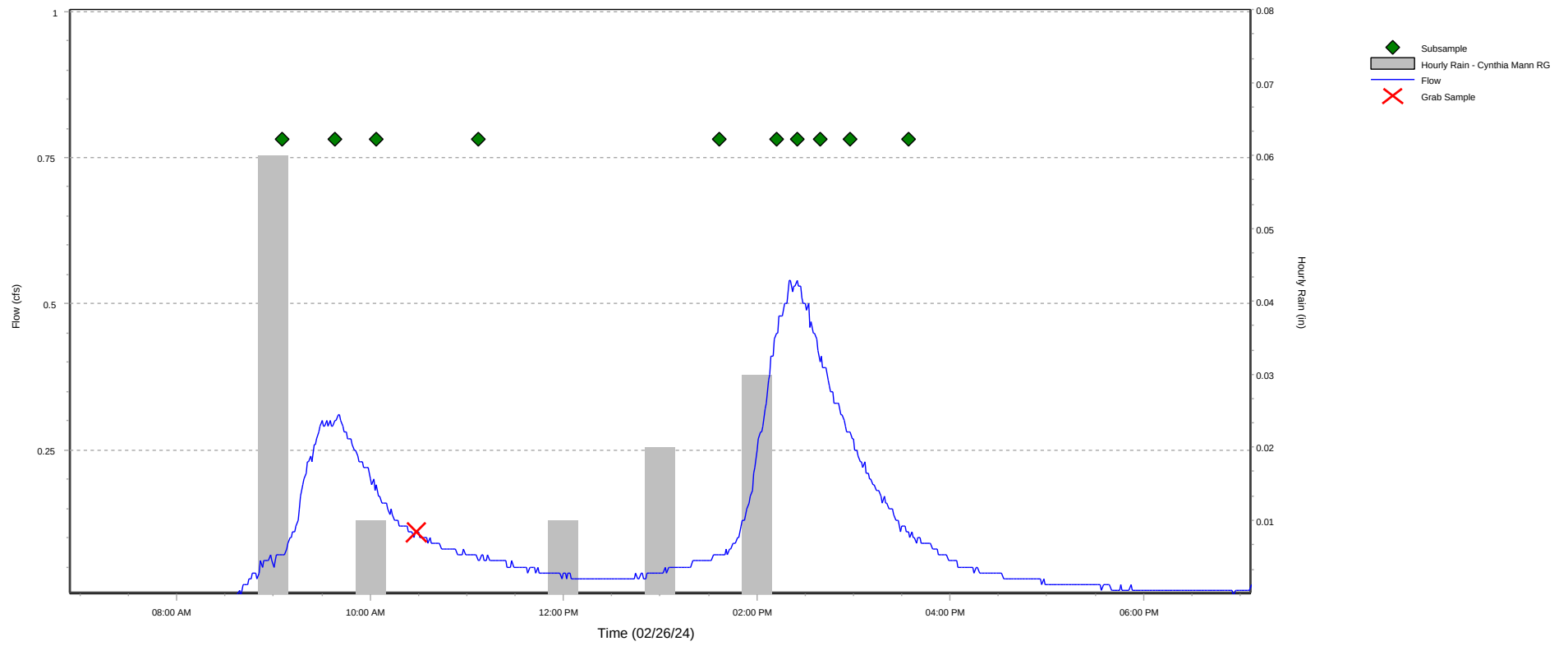
Calculated RC = Average (precip (ft) / [volume (ft³) x area (ft²)])

Where precip (ft) is the measured amount from local rain guage, and volume (ft³) is the measured discharge, and area (ft²) is the watershed area

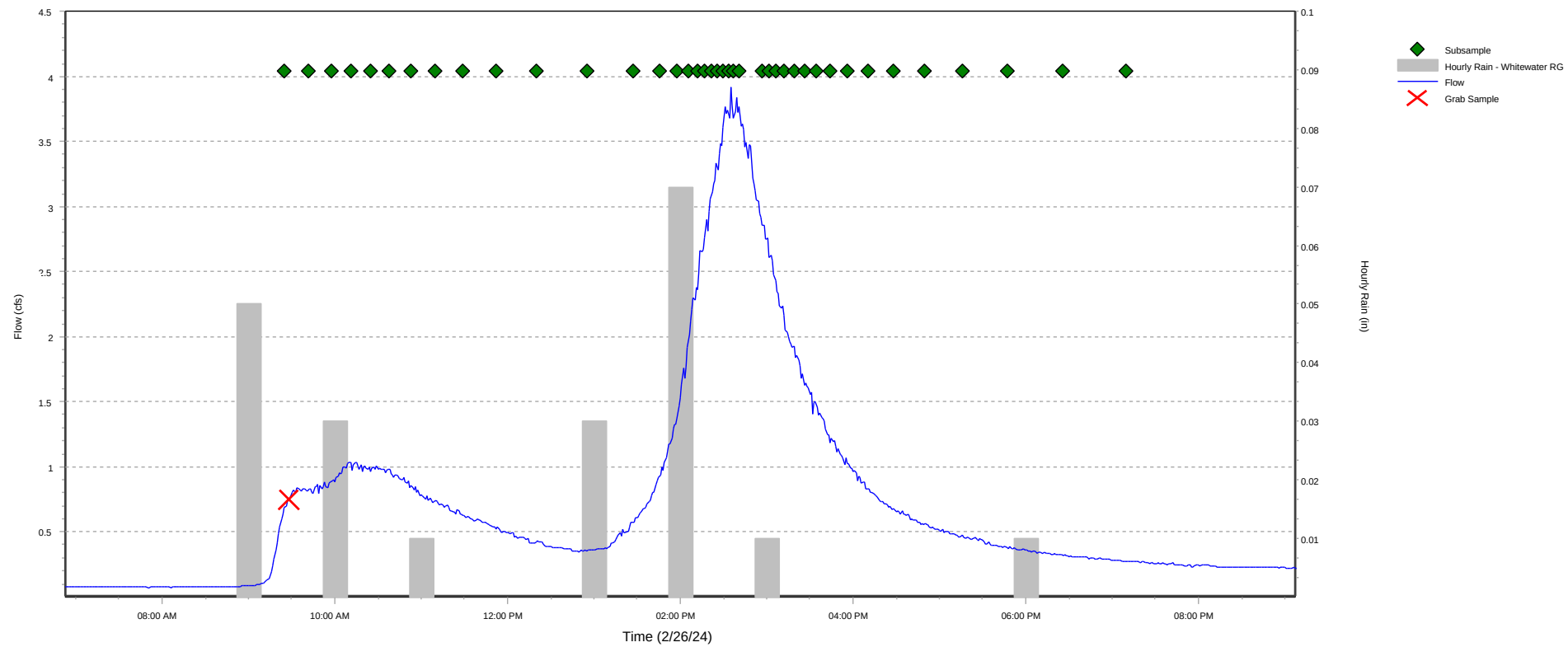
Expected volume (ft³) = RC x expected precip (ft) x area (ft²)

Attachment B: Storm Event Hydrographs

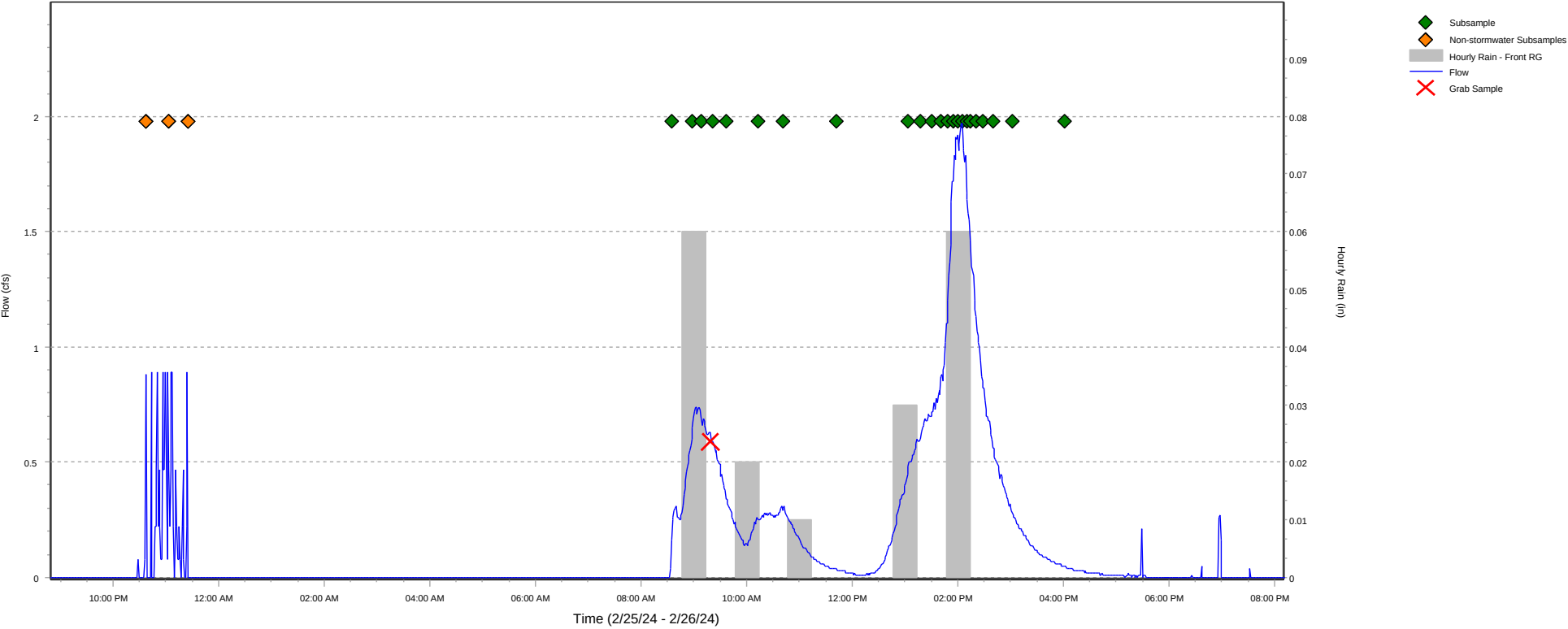
Lucky Hydrograph



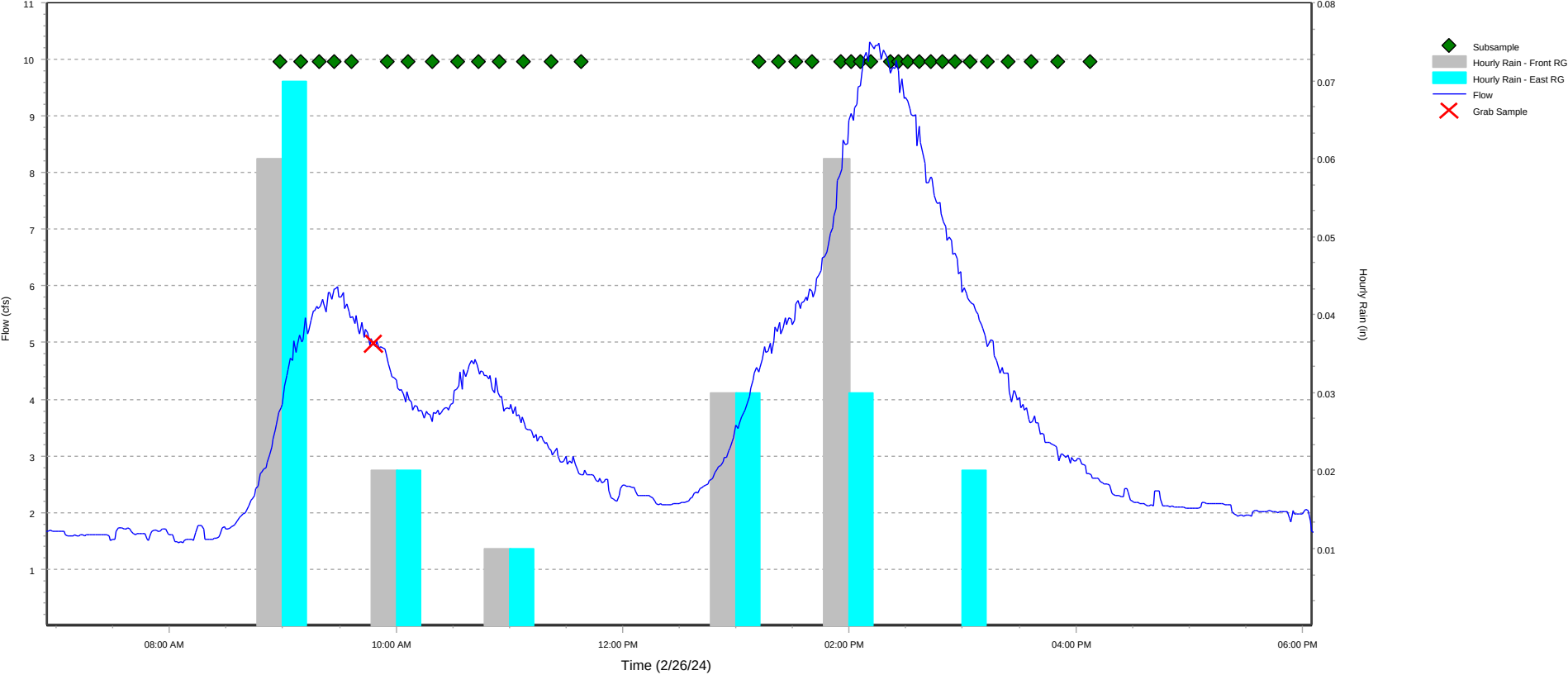
Whitewater Hydrograph



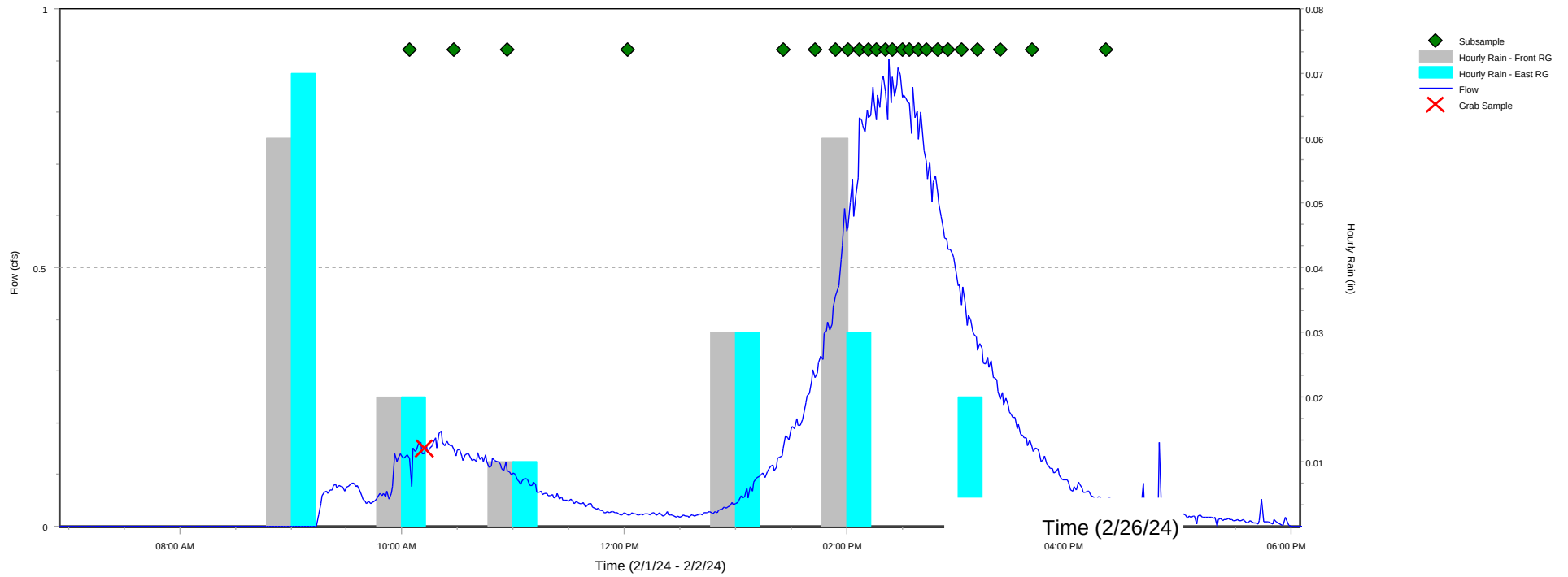
Main Hydrograph



Americana Hydrograph



AS_6 Hydrograph



Attachment C: Field Forms

Grab Sample Data Form

STATION: Lucky

Personnel: ST. PB **Date/Time On-Site:** 2/26/24 9:57

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
10:02	3.72	89.21 GPM	0.55	12.9		

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E. Coli</i>	240226-03 -WG	2/26/24	10:17	☒
Field Duplicate <i>E. Coli</i>	-101			☐
Field Blank <i>E. Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	10:12	4.75	4.89	8.27	125.4

Sampler Current Status	
First Subsample Date/Time	2/26/24 9:05
Last Subsample Date/Time	2/26/24 10:04
# of Subsamples taken	3

Comments:

Flow reading in GPM instead of cfs.

Grab Sample Data Form

STATION: Whitewater

Personnel: ST, PD Date/Time On-Site: 9:10⁵ 2/26/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
9:15	251	0.16	0.50	—		

Grab Information					
	Sample ID		Date	Time	Labeled?
Site E.Coli	240226-11	-WG	2/26/24	9:28	☒
Field Duplicate E.Coli	240226-11	-101	2/26/24	9:37:12:00	☒
Field Blank E.Coli	240226-11	-001	2/26/24	9:38:12:00	☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP07	9:42	5.97	10.88	7.74	749.2

Sampler Current Status	
First Subsample Date/Time	9:23
Last Subsample Date/Time	9:40
# of Subsamples taken	2

Comments:

~~Field duplicate + blank dumped. Main grab QC was successful.~~ ST
 Whitewater - alternate QC site. Main grab QC was successful, so Whitewater's QC discarded and not submitted to the lab. -ST

Grab Sample Data Form

STATION: MAIN

Personnel: KC, LS, MV Date/Time On-Site: 9:12 AM 2/26/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
9:12	5.10	311.35	1.25	12.9	—	—

Grab Information					
	Sample ID		Date	Time	Labeled?
Site E.Coli	240226-12	-WG	240226	0919	☒
Field Duplicate E.Coli	240226-12	-101	240226	0922	☒
Field Blank E.Coli	240226-12	-001	240226	0925	☒

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MR11	9:31	9.53	9.79	7.94	165.88

Sampler Current Status	
First Subsample Date/Time	22:38 2/25
Last Subsample Date/Time	9:09 2/26
# of Subsamples taken	6

Comments:

Grab Sample Data Form

STATION:

Americamp

Personnel:

KG, LS, MV

Date/Time On-Site:

9:42 2/26/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
9:42	9.19	5.24	3.130	12.09	—	—

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E.Coli</i>	24022614 -WG	240226	0948	☐
Field Duplicate <i>E.Coli</i>	-101			☐
Field Blank <i>E.Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP11	0951	8.74	10.54	7.53	470.55

Sampler Current Status	
First Subsample Date/Time	8:57 on 2/26
Last Subsample Date/Time	9:35 - 2/26
# of Subsamples taken	5

Comments:

Grab Sample Data Form

STATION: AS-6

Personnel: LE, LS, MV Date/Time On-Site: 10:05 2/26/24

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
10:05	2.962	0.15	0.71	12.2	—	—

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E.Coli</i>	240226-206 -WG	~~2/26~~ 2/26/24	10:05	☒
Field Duplicate <i>E.Coli</i>	-101			☐
Field Blank <i>E.Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP11	10:15	16.49	8.939	7.44	124.28

Sampler Current Status	
First Subsample Date/Time	10:04 - 2/26/24
Last Subsample Date/Time	10:04 - 2/26/24
# of Subsamples taken	1

Comments:

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

TATION: Lucky

SET UP

Personnel: KC, ST

Date/Time 2/25/24 10:15

On-Site: offsite at 10:40

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
10:22	1.72	0.00	0.00	12.9
Enable Condition or Velocity Cutoff:			2.72	
Deadband:			1.00	
Trigger Volume:			2895	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: ST

Date/Time 2/27/24 1253

On-Site:

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
12:57	1.72	1.72	0.02		12.6
Downloaded to:		ST flashdrive			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Lucky
 Personnel: ST, PB

Bottle 1 of 1
 Date/Time On-Site: 10/20 2/24/21

☒ Halt sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	240226 - D3 -WC
Approx Sample Volume (mL):	2000 ml
Clarity (ex. Clear, Cloudy, Silty):	Clear
Color (ex. Clear, Gray, Tan, Brown, Black):	Tan
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	2/26 9:05	Soc 57	13		
2	2/26 9:38		14		
3	2/26 10:04		15		
4	1107		16		
5	1337		17		
6	1412		18		
7	1425		19		
8	1439		20		
9	1458		21		
10	1534		22		
11			23		
12			24		

Comments:

If sampling is complete:

- ☒ Power off sampler, if separate from flowmeter
- ☒ Keep flowmeter running
- ☒ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle, add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____
☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

STATION:

Whitewater

SET UP

Personnel:

ST, ICC

Date/Time

On-Site:

2/25/24 10:52

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
10:55	1.86	0.04	0.17	—
Enable Condition:		3.05		
Hysteresis:		1.00		
Flow Pulse Interval:		800cf		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☐ Direct or Remote; Date/time Did not download
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

Flowmeter time was 7 minutes off. Time corrected. Did not download data. Reviewed data on flowmeter screen.

SHUT DOWN

Personnel:

ST

Date/Time

On-Site:

2/27/24 1336

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1336	2.39	0.13	0.41	—
Downloaded to:		Flowlink		

On-Site

- ☒ Replace flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 2/27 @ 10:25
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Whitewater
 Personnel: EC, ST

Bottle 1 of 2
 Date/Time On-Site: 2/26/24 1454

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240226-11</u> -WC
Approx Sample Volume (mL):	<u>14000 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/26 0923</u>	<u>Success</u>	13	<u>2/26 1325</u>	<u>Success</u>
2	<u>0940</u>		14	<u>1344</u>	
3	<u>0956</u>		15	<u>1356</u>	
4	<u>1010</u>		16	<u>1404</u>	
5	<u>1023</u>		17	<u>1411</u>	
6	<u>1037</u>		18	<u>1416</u>	
7	<u>1051</u>		19	<u>1420</u>	
8	<u>1108</u>		20	<u>1425</u>	
9	<u>1128</u>		21	<u>1428</u>	
10	<u>1156</u>		22	<u>1432</u>	
11	<u>1219</u>		23	<u>1436</u>	
12	<u>1254</u>		24	<u>1439</u>	

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2/26 1456</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: White Water
 Personnel: VCIST

Bottle 2 of 2

Date/Time On-Site: _____

☐ Halt sampler program
☐ Put lid on sample bottle; label sample bottle
Sample ID: <u>240226-11</u> -WC
Approx Sample Volume (mL): <u>9500 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	2/26/24 1455	Success	13	2/26/24 1715	Success
2	1500		14	1746	
3	1505		15	1824	
4	1511		16	1908	
5	1517		17		
6	1525		18		
7	1533		19		
8	1543		20		
9	1555		21		
10	1609		22		
11	1627		23		
12	1648		24		

Comments:

If sampling is complete:

- ☒ Power off sampler, if separate from flowmeter
- ☒ Keep flowmeter running
- ☒ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: Main

SET UP

Personnel: KC, ST

Date/Time: 2/25/24 1133

On-Site: 2/25/24 1133

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1136	0.87	0.00	0.00	12.8
Enable Condition or Velocity Cutoff:			1.87	
Deadband:			1.00	
Trigger Volume:			3411	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: ST

Date/Time: 2/27/24 1547

On-Site: 2/27/24 1547

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1547	0.85	0.00	0.00		12.4
Downloaded to: <u>Steven's USB</u>					

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Main
 Personnel: KC, ST

Bottle 1 of 2
 Date/Time On-Site: 2/26/24 1440

☒ Halt sampler program
☐ Put lid on sample bottle; label sample bottle
Sample ID: <u>240226-2012</u> -WC
Approx Sample Volume (mL): <u>13250 ml</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Brown</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	2/25/24 2238	Success	13	2/26/24 1318	Success
2	↓ 2304	↓	14	1330	↓
3	↓ 2326		15	1341	
4	2/26/24 0835		16	1349	
5	0858		17	1355	
6	0909		18	1400	
7	0921		19	1405	
8	0937		20	1410	
9	1013		21	1415	
10	1042		22	1421	
11	1142		23	1429	
12	↓ 1304	✓	24	↓ 1440	✓

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle, add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2/26/24 1443</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Main
 Personnel: EG ST

Bottle 2 of 2

Date/Time On-Site: _____

☐ Halt sampler program		
☐ Put lid on sample bottle; label sample bottle		
Sample ID:	240226-12	-WC
Approx Sample Volume (mL):	800 mL	
Clarity (ex. Clear, Cloudy, Silty):	Clear	
Color (ex. Clear, Gray, Tan, Brown, Black):	Clear	
QA/QC Sample ID:	-103	(Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	2/26/24 1502	Success	13		
2	↓ 1601	↓	14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

STATION: Americana

SET UP

Personnel: KC, ST

Date/Time

On-Site: 2/25/24 1212

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1212	5.53	2.168	2.061	12.41
Enable Condition:		6.53	7.59	
Hysteresis:		1.00		
Flow Pulse Interval:		2900 cfs		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time Did not need to download
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments: Data not downloaded. Recent flow history was viewed on the flowmeter screen.

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 2/27/24 1502

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
15:03	5.56	1.80	2.217	11.90
Downloaded to:		Flowlink		

On-Site

- ☒ Replace flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 2/27 10:21
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Americana
 Personnel: ST, KC

Bottle 1 of 2
 Date/Time On-Site: 2/24/24 1415

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240226-14</u> -WC
Approx Sample Volume (mL):	<u>12,500 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/24/24 0857</u>	<u>Success</u>	13	<u>2/26/24 1104</u>	<u>Success</u>
2	<u>0908</u>		14	<u>1121</u>	
3	<u>0918</u>		15	<u>1137</u>	
4	<u>0926</u>		16	<u>1311 1150</u>	
5	<u>0935</u>		17	<u>1321</u>	
6	<u>0944</u>	<u>Sample skipped</u>	18	<u>1330</u>	
7	<u>0954</u>	<u>Success</u>	19	<u>1339</u>	
8	<u>1005</u>		20	<u>1347</u>	<u>skipped</u>
9	<u>1018</u>		21	<u>1354</u>	<u>Success</u>
10	<u>1031</u>		22	<u>1400</u>	
11	<u>1042</u>		23	<u>1405</u>	
12	<u>1053</u>		24	<u>1410</u>	

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2/26 1418</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Americana

Personnel: V.C. ST

Bottle 2 of 2

Date/Time On-Site: 2/26/24 1805

☒ Halt sampler program	
☒ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240226 - 14</u> -WC
Approx Sample Volume (mL):	<u>8,000 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Tan</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/26/24 1420</u>	<u>Success</u>	13	<u>2/26/24 1406</u>	<u>Successful</u>
2	<u>1425</u>		14		
3	<u>1430</u>		15		
4	<u>1436</u>		16		
5	<u>1442</u>		17		
6	<u>1448</u>		18		
7	<u>1455</u>		19		
8	<u>1503</u>		20		
9	<u>1512</u>		21		
10	<u>1523</u>		22		
11	<u>1535</u>		23		
12	<u>1549</u>		24		

Comments:

If sampling is complete:

- ☒ Power off sampler, if separate from flowmeter
- ☒ Keep flowmeter running
- ☒ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☐ Keep flowmeter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning

Date/Time Restarted: _____

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: AS-6

SET UP

Personnel: KC, ST

Date/Time
On-Site: 2/25/24 1253

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1253	0.00	0.00	0.00	11.9/12.4
Enable Condition or Velocity Cutoff:			0.02	
Deadband:				
Trigger Volume:			221	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

SHUT DOWN

Personnel: ST

Date/Time
On-Site: 2/27/24 1352

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
1353	0.000	0.00	0.00	5448.2	12.4
Downloaded to:		Rugged - SD drive			
		Raw data			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: AS-6
 Personnel: KC, ST

Bottle 1 of 2
 Date/Time On-Site: 2/26/24 1553

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240226-206</u> -WC
Approx Sample Volume (mL):	<u>12,500 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Silty</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Brown</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/26/24 1004</u>	<u>Success</u>	13	<u>2/26/24 1425</u>	<u>Success</u>
2	<u>1028</u>		14	<u>1430</u>	
3	<u>1057</u>		15	<u>1434</u>	
4	<u>1202</u>		16	<u>1439</u>	
5	<u>1326</u>		17	<u>1443</u>	
6	<u>1343</u>		18	<u>1449</u>	
7	<u>1354</u>		19	<u>1455</u>	
8	<u>1401</u>		20	<u>1502</u>	
9	<u>1407</u>		21	<u>1511</u>	
10	<u>1412</u>		22	<u>1523</u>	
11	<u>1416</u>		23	<u>1540</u>	
12	<u>1421</u>		24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle, add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2/26 4:07</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: AS-6
 Personnel: VC, ST

Bottle 2 of 2
 Date/Time On-Site: 2/26/24 1853

☒ Halt sampler program
☐ Put lid on sample bottle; label sample bottle
Sample ID: <u>240226 - 206</u> -WC
Approx Sample Volume (mL): <u>400 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Clear</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>2/26/24 11020</u>	<u>Success</u>	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Attachment D: Storm Event Analytical Reports

Report Date: 03/08/2024 13:51



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00332-01	ACST1B	240226-03-WG	Water		02/26/2024	02/26/2024
AC00332-02	ACST1B	240226-11-WG	Water		02/26/2024	02/26/2024
AC00332-03	ACST1B	240226-12-WG	Water		02/26/2024	02/26/2024
AC00332-04	ACST1B	240226-12-101	Water		02/26/2024	02/26/2024
AC00332-05	ACST1B	240226-12-001	Water		02/26/2024	02/26/2024
AC00332-06	ACST1B	240226-14-WG	Water		02/26/2024	02/26/2024

Report Date: 03/08/2024 13:51



Boise City Public Works
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Analysis Report

Location: ACST1B Location Description: 240226-03-WG
Date/Time Collected: 02/26/2024 10:17
Lab Number: AC00332-01 Sample Collector: S.T
Sample Type: Grab Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst		
				MDL *	MDL				Reference	Initials	Qualifier
Microbiology											
E. Coli	B240669	37.9MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR		
Wet Chemistry											
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:38	ALN		

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



Boise City Public Works
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Analysis Report

Location: ACST1B
Date/Time Collected: 02/26/2024 09:28
Lab Number: AC00332-02
Sample Type: Grab

Location Description: 240226-11-WG
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Microbiology										
E. Coli	B240669	38.3MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR	
Wet Chemistry										
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:38	ALN	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



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Boise, Idaho 83714-1076
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Analysis Report

Location: ACST1B

Location Description: 240226-12-WG

Date/Time Collected: 02/26/2024 09:19

Lab Number: AC00332-03

Sample Collector: L.S

Sample Type: Grab

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Microbiology										
E. Coli	B240669	24.3MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR	
Wet Chemistry										
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:38	ALN	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



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Analysis Report

Location: ACST1B

Location Description: 240226-12-101

Date/Time Collected: 02/26/2024 12:00

Lab Number: AC00332-04

Sample Collector: L.S

Sample Type: Grab

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Microbiology										
E. Coli	B240669	26.9MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR	
Wet Chemistry										
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:38	ALN	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



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Analysis Report

Location: ACST1B Location Description: 240226-12-001
Date/Time Collected: 02/26/2024 12:00
Lab Number: AC00332-05 Sample Collector: L.S.
Sample Type: Grab Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst	
				MDL *	MDL				Reference	Initials
Microbiology										
E Coli	B240669	<1.0MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR	U
Wet Chemistry										
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:42	ALN	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B, was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



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Analysis Report

Location: ACST1B

Location Description: 240226-14-WG

Date/Time Collected: 02/26/2024 09:48

Lab Number: AC00332-06

Sample Collector: M.V

Sample Type: Grab

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Microbiology										
E. Coli	B240669	125.9 MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR	
Wet Chemistry										
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:42	ALN	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



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Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B240669									
Blank (B240669-BLK1)									
E. Coli	Absent						02/27/2024	KMR	
LCS (B240669-BS1)									
E. Coli				Present			02/27/2024	KMR	
Duplicate (B240669-DUP1) Source ID: WB02977-06									
E. Coli					Pass	128	02/27/2024	KMR	
Duplicate (B240669-DUP2) Source ID: AC00332-01									
E. Coli					Pass	128	02/27/2024	KMR	

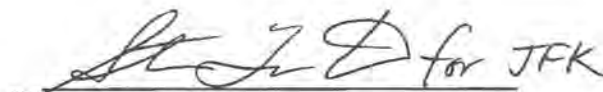


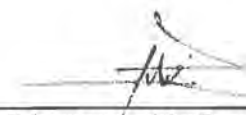
Notes and Definitions

Item	Definition
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628

Stormwater-PI

Steven Turner
Paul Bomber
Kristen Christensen
Lindsey Sincot Mike Van Lydegraf

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colliert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
Acc00332																									
-01	2/26/24		1017		240226-03-WG	ST	X	X												X					1
-02			0928		240226-11-WG	ST	X	X												X					1
-03			0919		240226-12-WG	LS	X	X												X					1
-04			1200		240226-12-101	LS	X	X												X					1
-05			1200		240226-12-001	LS	X	X												X					1
-06			0948		240226-14-WG	LV	X	X												X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Kristen Christensen</i>	2/26/24 1201	<i>April [Signature]</i> 2-26-24 1204	

Report Date: 03/08/2024 13:51



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00333-01	ACST1B	240226-206-WG	Water		02/26/2024	02/26/2024

Report Date: 03/08/2024 13:51



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 02/26/2024 10:12
Lab Number: AC00333-01
Sample Type: Grab

Location Description: 240226-206-WG
Sample Collector: M.V
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Microbiology										
E Coli	B240669	53.7 MPN/100 mL		1.0	1.0	IDEXX - Colilert	02/26/24 13:24	2/27/24 13:41	KMR	
Wet Chemistry										
Chlorine Screen	B240674	Absent				SM 4500-CL G-2000 mod	02/26/24	2/26/24 12:42	ALN	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 03/08/2024 13:51



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1075
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B240669									
Blank (B240669-BLK1)									
E. Coli	Absent						02/27/2024	KMR	
LCS (B240669-BS1)									
E. Coli				Present			02/27/2024	KMR	
Duplicate (B240669-DUP1) Source ID: WB02977-06									
E. Coli					Pass	128	02/27/2024	KMR	
Duplicate (B240669-DUP2) Source ID: AC00332-01									
E. Coli					Pass	128	02/27/2024	KMR	



Notes and Definitions

Item	Definition

No notes entered.

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order: 6
Project: S
Sampler(s): 2

Stormwater-PI

Kristen Chisholm
Lindsey Smoot
Mike Van Lydegraf

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>[Signature]</i>	2/26/24 1201	<i>[Signature]</i> 2-26-24 1204	

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00337-01	ACST1C	240226-03-WC	Water		02/26/2024	02/27/2024
Comments: Container temp #1 - 4.8 C						
AC00337-02	ACST1C	240226-11-WC	Water		02/26/2024	02/27/2024
Comments: Container temps: #1 - 6.4 C, #2 - 5.7 C						
AC00337-03	ACST1C	240226-12-WC	Water		02/26/2024	02/27/2024
Comments: Container temps: #1 - 8.4 C, #2 - 7.2 C						
AC00337-04	ACST1C	240226-14-WC	Water		02/26/2024	02/27/2024
Comments: Container temps: #1 - 7.4 C, #2 - 5.6 C						

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C

Location Description: 240226-03-WC

Date/Time Collected: 02/26/2024 09:05 - 02/26/2024 15:34

Lab Number: AC00337-01

Sample Collector: S.T

Sample Type: Composite

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240744	0.476	mg/L	0.0500	0.0500	SM 4500-NH3 D-2011	03/01/24	3/1/24 11:29	MEC	
BOD5	B240684	13.5	mg/L	2.00	2.00	SM 5210 B-2016	02/27/24	3/3/24 11:21	BAK	
Chloride	B240796	8.92	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	03/06/24	3/6/24 22:25	ALN	
COD	B240680	60.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/27/24	2/27/24 10:52	MCB	
Nitrate-Nitrite, as N	B240718	0.969	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/29/24	2/29/24 12:18	LRF	
TKN	B240816	1.71	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/07/24	3/8/24 9:46	JAL	
Total Dissolved Solids	B240696	114	mg/L	20.0	20.0	SM 2540 C-2015	02/28/24	2/29/24 13:59	MEC	
Total Suspended Solids	B240708	18.1	mg/L	0.900	0.900	SM 2540 D-2015	02/28/24	2/28/24 10:21	RKT	
Turbidity	B240698	18.9	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	02/28/24	2/28/24 8:26	ASE	
Dissolved Wet Chemistry										
Orthophosphate, as P	B240685	0.124	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/27/24	2/27/24 10:06	RKT	
Total Metals										
Mercury	B240817	0.0150	ug/L	0.0100	0.0100	EPA 245.1	03/07/24	3/8/24 8:12	SAS	
Arsenic	B240750	2.6	ug/L	0.070	0.070	EPA 200.8	03/02/24	3/3/24 13:49	DMW	
Cadmium	B240750	0.031	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:49	DMW	
Calcium	B240695	17.6	mg/L	0.0400	0.0400	EPA 200.7	02/28/24	3/1/24 11:18	AMO	
Lead	B240750	0.72	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:49	DMW	
Magnesium	B240695	2250	ug/L	80.0	80.0	EPA 200.7	02/28/24	3/1/24 11:18	AMO	
Phosphorus as P	B240695	0.262	mg/L	0.0120	0.0120	EPA 200.7	02/28/24	3/1/24 11:18	AMO	
Hardness	B240695	53.2	mg/L	0.100	0.100	SM 2340 B-2011	02/28/24	3/1/24 11:18	AMO	
Dissolved Metals										
Cadmium	B241178	0.011	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 16:04	DMW	
Copper	B240802	4.5	ug/L	0.15	0.15	EPA 200.8	03/08/24	3/8/24 16:28	DMW	
Lead	B241178	0.028	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 16:04	DMW	
Zinc	B240802	13.5	ug/L	0.50	0.50	EPA 200.8	03/08/24	3/8/24 16:28	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C
Date/Time Collected: 02/26/2024 09:23 - 02/26/2024 19:08
Lab Number: AC00337-02
Sample Type: Composite

Location Description: 240226-11-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240744	0.596	mg/L	0.0500	0.0500	SM 4500-NH3 D-2011	03/01/24	3/1/24 11:45	MEC	
BOD5	B240684	12.6	mg/L	2.00	2.00	SM 5210 B-2016	02/27/24	3/3/24 11:12	BAK	
Chloride	B240796	44.4	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	03/07/24	3/7/24 0:10	ALN	
COD	B240680	84.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/27/24	2/27/24 10:58	MCB	
Nitrate-Nitrite, as N	B240718	0.921	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/29/24	2/29/24 12:19	LRF	
TKN	B240816	2.43	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/07/24	3/8/24 9:47	JAL	
Total Dissolved Solids	B240696	182	mg/L	20.0	20.0	SM 2540 C-2015	02/28/24	2/29/24 14:00	MEC	
Total Suspended Solids	B240683	47.3	mg/L	0.900	0.900	SM 2540 D-2015	02/27/24	2/27/24 10:25	MEC	
Turbidity	B240698	52.3	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/28/24	2/28/24 9:53	ASE	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240685	0.174	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/27/24	2/27/24 10:07	RKT	
Total Metals										
Mercury	B240817	0.0151	ug/L	0.0100	0.0100	EPA 245.1	03/07/24	3/8/24 8:16	SAS	
Arsenic	B240750	2.6	ug/L	0.070	0.070	EPA 200.8	03/02/24	3/3/24 13:52	DMW	
Cadmium	B240750	0.062	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:52	DMW	
Calcium	B240695	22.5	mg/L	0.0400	0.0400	EPA 200.7	02/28/24	3/1/24 11:24	AMO	
Lead	B240750	3.8	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:52	DMW	
Magnesium	B240695	5260	ug/L	80.0	80.0	EPA 200.7	02/28/24	3/1/24 11:24	AMO	
Phosphorus as P	B240695	0.347	mg/L	0.0120	0.0120	EPA 200.7	02/28/24	3/1/24 11:24	AMO	
Hardness	B240695	77.8	mg/L	0.100	0.100	SM 2340 B-2011	02/28/24	3/1/24 11:24	AMO	
Dissolved Metals										
Cadmium	B241178	0.014	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 16:07	DMW	
Copper	B240802	4.4	ug/L	0.15	0.15	EPA 200.8	03/08/24	3/8/24 16:30	DMW	
Lead	B241178	0.093	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 16:07	DMW	
Zinc	B240802	24.5	ug/L	0.50	0.50	EPA 200.8	03/08/24	3/8/24 16:30	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C
Date/Time Collected: 02/25/2024 22:38 - 02/26/2024 16:01
Lab Number: AC00337-03
Sample Type: Composite

Location Description: 240226-12-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240744	0.829	mg/L	0.0500	0.0500	SM 4500-NH3 D-2011	03/01/24	3/1/24 11:37	MEC	
BOD5	B240684	13.9	mg/L	2.00	2.00	SM 5210 B-2016	02/27/24	3/3/24 11:07	BAK	
Chloride	B240796	17.0	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	03/07/24	3/7/24 0:37	ALN	
COD	B240680	119	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/27/24	2/27/24 10:58	MCB	
Nitrate-Nitrite, as N	B240718	0.424	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/29/24	2/29/24 12:21	LRF	
TKN	B240816	1.96	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/07/24	3/8/24 9:48	JAL	
Total Dissolved Solids	B240696	85.2	mg/L	20.0	20.0	SM 2540 C-2015	02/28/24	2/29/24 14:01	MEC	
Total Suspended Solids	B240683	104	mg/L	0.900	0.900	SM 2540 D-2015	02/27/24	2/27/24 10:28	MEC	
Turbidity	B240698	94.7	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/28/24	2/28/24 9:08	ASE	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240685	0.0631	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/27/24	2/27/24 10:09	RKT	
Total Metals										
Mercury	B240817	0.0191	ug/L	0.0100	0.0100	EPA 245.1	03/07/24	3/8/24 8:51	SAS	
Arsenic	B240750	1.5	ug/L	0.070	0.070	EPA 200.8	03/02/24	3/3/24 13:54	DMW	
Cadmium	B240750	0.13	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:54	DMW	
Calcium	B240695	7.84	mg/L	0.0400	0.0400	EPA 200.7	02/28/24	3/1/24 11:51	AMO	
Lead	B240750	6.1	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:54	DMW	
Magnesium	B240695	2470	ug/L	80.0	80.0	EPA 200.7	02/28/24	3/1/24 11:51	AMO	
Phosphorus as P	B240695	0.231	mg/L	0.0120	0.0120	EPA 200.7	02/28/24	3/1/24 11:51	AMO	
Hardness	B240695	29.8	mg/L	0.100	0.100	SM 2340 B-2011	02/28/24	3/1/24 11:51	AMO	
Dissolved Metals										
Cadmium	B241178	0.032	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 16:09	DMW	
Copper	B240802	5.6	ug/L	0.15	0.15	EPA 200.8	03/08/24	3/8/24 16:33	DMW	
Lead	B241178	0.12	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 16:09	DMW	
Zinc	B240802	51.7	ug/L	0.50	0.50	EPA 200.8	03/08/24	3/8/24 16:33	DMW	

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Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1C
Date/Time Collected: 02/26/2024 08:57 - 02/26/2024 16:06
Lab Number: AC00337-04
Sample Type: Composite

Location Description: 240226-14-WC
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240744	0.496	mg/L	0.0500	0.0500	SM 4500-NH3 D-2011	03/01/24	3/1/24 11:39	MEC	
BOD5	B240684	12.6	mg/L	2.00	2.00	SM 5210 B-2016	02/27/24	3/3/24 11:01	BAK	
Chloride	B240796	56.1	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	03/07/24	3/7/24 1:03	ALN	
COD	B240680	85.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/27/24	2/27/24 10:58	MCB	
Nitrate-Nitrite, as N	B240718	0.940	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/29/24	2/29/24 12:22	LRF	
TKN	B240816	1.47	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/07/24	3/8/24 9:49	JAL	
Total Dissolved Solids	B240696	214	mg/L	20.0	20.0	SM 2540 C-2015	02/28/24	2/29/24 14:03	MEC	
Total Suspended Solids	B240683	54.3	mg/L	0.900	0.900	SM 2540 D-2015	02/27/24	2/27/24 11:21	MEC	
Turbidity	B240698	51.1	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/28/24	2/28/24 10:00	ASE	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240685	0.106	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/27/24	2/27/24 10:10	RKT	
Total Metals										
Mercury	B240817	0.0148	ug/L	0.0100	0.0100	EPA 245.1	03/07/24	3/8/24 8:54	SAS	
Arsenic	B240750	3.3	ug/L	0.070	0.070	EPA 200.8	03/02/24	3/3/24 13:57	DMW	
Cadmium	B240750	0.097	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:57	DMW	
Calcium	B240695	31.4	mg/L	0.0400	0.0400	EPA 200.7	02/28/24	3/1/24 11:57	AMO	
Lead	B240750	3.9	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:57	DMW	
Magnesium	B240695	5710	ug/L	80.0	80.0	EPA 200.7	02/28/24	3/1/24 11:57	AMO	
Phosphorus as P	B240695	0.276	mg/L	0.0120	0.0120	EPA 200.7	02/28/24	3/1/24 11:57	AMO	
Hardness	B240695	102	mg/L	0.100	0.100	SM 2340 B-2011	02/28/24	3/1/24 11:57	AMO	
Dissolved Metals										
Cadmium	B241178	0.021	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 16:12	DMW	
Copper	B240802	4.0	ug/L	0.15	0.15	EPA 200.8	03/08/24	3/8/24 16:43	DMW	
Lead	B241178	0.063	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 16:12	DMW	
Zinc	B240802	24.3	ug/L	0.50	0.50	EPA 200.8	03/08/24	3/8/24 16:43	DMW	

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Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B240680									
Blank (B240680-BLK1)									
COD	<7	mg/L					02/27/2024	MCB	U
LCS (B240680-BS1)									
COD			100	90-110			02/27/2024	MCB	
Duplicate (B240680-DUP1)	Source ID: AC00335-01								
COD					3.92	10	02/27/2024	MCB	
Batch: B240683									
Blank (B240683-BLK1)									
Total Suspended Solids	<0.9	mg/L					02/27/2024	MEC	U
LCS (B240683-BS1)									
Total Suspended Solids			101	90-110			02/27/2024	MEC	
Duplicate (B240683-DUP1)	Source ID: BB03630-02								
Total Suspended Solids					8.03	20	02/27/2024	MEC	
Batch: B240684									
Blank (B240684-BLK1)									
BOD5	<2	mg/L					03/03/2024	BAK	U
LCS (B240684-BS1)									
BOD5			102	84.6-115.4			03/03/2024	BAK	
LCS (B240684-BS2)									
BOD5			109	84.6-115.4			03/03/2024	BAK	
Duplicate (B240684-DUP1)	Source ID: BB03630-03								
BOD5					3.10	30	03/03/2024	BAK	
Batch: B240696									
Blank (B240696-BLK1)									
Total Dissolved Solids	<20	mg/L					02/29/2024	MEC	U
LCS (B240696-BS1)									
Total Dissolved Solids			99.4	90-110			02/29/2024	MEC	
Duplicate (B240696-DUP1)	Source ID: LS01873-01								
Total Dissolved Solids					0.700	10	02/29/2024	MEC	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240698									
Blank (B240698-BLK1)									
Turbidity	<0.3	NTU					02/28/2024	ASE	U
LCS (B240698-BS1)									
Turbidity			98.2	90-110			02/28/2024	ASE	
Duplicate (B240698-DUP1) Source ID: AC00337-04									
Turbidity					3.45	25	02/28/2024	ASE	D
Batch: B240708									
Blank (B240708-BLK1)									
Total Suspended Solids	<0.9	mg/L					02/28/2024	RKT	U
LCS (B240708-BS1)									
Total Suspended Solids			96.2	90-110			02/28/2024	RKT	
Duplicate (B240708-DUP1) Source ID: BB03631-02									
Total Suspended Solids					3.63	20	02/28/2024	RKT	
Duplicate (B240708-DUP2) Source ID: BB03632-01									
Total Suspended Solids					6.00	20	02/28/2024	RKT	
Batch: B240718									
Blank (B240718-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					02/29/2024	LRF	U
Blank (B240718-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					02/29/2024	LRF	U
LCS (B240718-BS1)									
Nitrate-Nitrite, as N			104	90-110			02/29/2024	LRF	
LCS (B240718-BS2)									
Nitrate-Nitrite, as N			99.7	90-110			02/29/2024	LRF	
Duplicate (B240718-DUP1) Source ID: BB03631-02									
Nitrate-Nitrite, as N					NR	10	02/29/2024	LRF	
Duplicate (B240718-DUP2) Source ID: AC00336-01									
Nitrate-Nitrite, as N					0.514	10	02/29/2024	LRF	
Duplicate (B240718-DUP3) Source ID: LS01875-02									
Nitrate-Nitrite, as N					0.470	10	02/29/2024	LRF	
Matrix Spike (B240718-MS1) Source ID: BB03631-02									
Nitrate-Nitrite, as N			101	90-110			02/29/2024	LRF	
Matrix Spike (B240718-MS2) Source ID: AC00336-01									
Nitrate-Nitrite, as N			99.9	90-110			02/29/2024	LRF	
Matrix Spike (B240718-MS3) Source ID: LS01875-02									
Nitrate-Nitrite, as N			98.2	90-110			02/29/2024	LRF	
Matrix Spike Dup (B240718-MSD1) Source ID: BB03631-02									
Nitrate-Nitrite, as N			106	90-110	4.55	10	02/29/2024	LRF	
Matrix Spike Dup (B240718-MSD2) Source ID: AC00336-01									
Nitrate-Nitrite, as N			99.9	90-110	0.0278	10	02/29/2024	LRF	

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(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240718 (Continued)									
Matrix Spike Dup (B240718-MSD3)	Source ID: LS01875-02								
Nitrate-Nitrite, as N			97.3	90-110	0.479	10	02/29/2024	LRF	
Batch: B240744									
Blank (B240744-BLK1)									
Ammonia, as N	<50	ug/L					03/01/2024	MEC	U
LCS (B240744-BS1)									
Ammonia, as N			97.7	90-110			03/01/2024	MEC	
Duplicate (B240744-DUP1)	Source ID: LS01873-02								
Ammonia, as N					1.34	10	03/01/2024	MEC	
Duplicate (B240744-DUP2)	Source ID: BB03629-03								
Ammonia, as N					1.56	10	03/01/2024	MEC	
Matrix Spike (B240744-MS1)	Source ID: LS01873-02								
Ammonia, as N			98.3	80-120			03/01/2024	MEC	
Matrix Spike (B240744-MS2)	Source ID: BB03629-03								
Ammonia, as N			104	80-120			03/01/2024	MEC	
Matrix Spike Dup (B240744-MSD1)	Source ID: LS01873-02								
Ammonia, as N			100	80-120	1.38	10	03/01/2024	MEC	
Matrix Spike Dup (B240744-MSD2)	Source ID: BB03629-03								
Ammonia, as N			106	80-120	1.01	10	03/01/2024	MEC	
Batch: B240796									
Blank (B240796-BLK1)									
Chloride	<0.015	mg/L					03/06/2024	ALN	U
Blank (B240796-BLK2)									
Chloride	<0.015	mg/L					03/07/2024	ALN	U
LCS (B240796-BS1)									
Chloride			95.7	90-110			03/06/2024	ALN	
LCS (B240796-BS2)									
Chloride			96.0	90-110			03/06/2024	ALN	
LCS (B240796-BS3)									
Chloride			95.4	90-110			03/07/2024	ALN	
Duplicate (B240796-DUP1)	Source ID: RW00054-10								
Chloride					3.94	10	03/07/2024	ALN	D
Duplicate (B240796-DUP2)	Source ID: RW00056-07								
Chloride					0.398	10	03/07/2024	ALN	D
Duplicate (B240796-DUP3)	Source ID: AC00337-01								
Chloride					0.672	10	03/06/2024	ALN	
Duplicate (B240796-DUP4)	Source ID: LS01873-01								
Chloride					0.319	10	03/07/2024	ALN	D
Matrix Spike (B240796-MS1)	Source ID: RW00054-10								
Chloride			96.6	90-110			03/07/2024	ALN	D

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240796 (Continued)									
Matrix Spike (B240796-MS2) Chloride	Source ID: RW00056-07		94.1	90-110			03/07/2024	ALN	D
Matrix Spike (B240796-MS3) Chloride	Source ID: AC00337-01		93.9	90-110			03/06/2024	ALN	
Matrix Spike (B240796-MS4) Chloride	Source ID: LS01873-01		94.6	90-110			03/07/2024	ALN	D
Matrix Spike Dup (B240796-MSD1) Chloride	Source ID: RW00054-10		97.2	90-110	0.377	10	03/07/2024	ALN	D
Matrix Spike Dup (B240796-MSD2) Chloride	Source ID: RW00056-07		94.2	90-110	0.0228	10	03/07/2024	ALN	D
Matrix Spike Dup (B240796-MSD3) Chloride	Source ID: AC00337-01		97.5	90-110	2.75	10	03/07/2024	ALN	
Matrix Spike Dup (B240796-MSD4) Chloride	Source ID: LS01873-01		95.4	90-110	0.336	10	03/07/2024	ALN	D
Batch: B240816									
Blank (B240816-BLK1) TKN	<0.1	mg/L					03/08/2024	JAL	U
Blank (B240816-BLK2) TKN	<0.1	mg/L					03/08/2024	JAL	U
Blank (B240816-BLK3) TKN	<0.1	mg/L					03/08/2024	JAL	U
LCS (B240816-BS1) TKN			96.1	80-120			03/08/2024	JAL	
LCS (B240816-BS2) TKN			105	80-120			03/08/2024	JAL	
LCS (B240816-BS3) TKN			104	80-120			03/08/2024	JAL	
Duplicate (B240816-DUP1) TKN	Source ID: BB03631-02				1.33	20	03/08/2024	JAL	D
Duplicate (B240816-DUP2) TKN	Source ID: BB03638-01				1.21	20	03/08/2024	JAL	D
Duplicate (B240816-DUP3) TKN	Source ID: LS01875-05				1.25	20	03/08/2024	JAL	D
Matrix Spike (B240816-MS1) TKN	Source ID: BB03631-02		106	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS2) TKN	Source ID: BB03638-01		107	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS3) TKN	Source ID: LS01875-05		108	80-120			03/08/2024	JAL	D

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier

Wet Chemistry (Continued)**Batch: B240816 (Continued)**

Matrix Spike (B240816-MS4) TKN	Source ID: RW00055-01		107	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS5) TKN	Source ID: RW00055-03		105	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS6) TKN	Source ID: RW00055-04		103	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS7) TKN	Source ID: RW00055-06		102	80-120			03/08/2024	JAL	D
Matrix Spike Dup (B240816-MSD1) TKN	Source ID: BB03631-02		114	80-120	2.56	20	03/08/2024	JAL	D
Matrix Spike Dup (B240816-MSD2) TKN	Source ID: BB03638-01		115	80-120	2.66	20	03/08/2024	JAL	D
Matrix Spike Dup (B240816-MSD3) TKN	Source ID: LS01875-05		114	80-120	2.43	20	03/08/2024	JAL	D

Dissolved Wet Chemistry**Batch: B240685**

Blank (B240685-BLK1) Orthophosphate, as P		<0.003	mg/L				02/27/2024	RKT	U
LCS (B240685-BS1) Orthophosphate, as P				96.3	90-110		02/27/2024	RKT	
Duplicate (B240685-DUP1) Orthophosphate, as P	Source ID: LS01873-02					0.0687	10	02/27/2024	RKT D
Duplicate (B240685-DUP3) Orthophosphate, as P	Source ID: RW00054-07RE1					0.433	10	02/27/2024	RKT D
Matrix Spike (B240685-MS1) Orthophosphate, as P	Source ID: LS01873-02		98.4	90-110			02/27/2024	RKT	D
Matrix Spike (B240685-MS3) Orthophosphate, as P	Source ID: RW00054-07RE1		101	90-110			02/27/2024	RKT	D
Matrix Spike Dup (B240685-MSD1) Orthophosphate, as P	Source ID: LS01873-02		98.5	90-110	0.0349	10	02/27/2024	RKT	D
Matrix Spike Dup (B240685-MSD3) Orthophosphate, as P	Source ID: RW00054-07RE1		101	90-110	0.0489	10	02/27/2024	RKT	D

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(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B240695									
Blank (B240695-BLK1)									
Calcium	<0.04	mg/L					03/01/2024	AMO	U
Magnesium	<80	ug/L					03/01/2024	AMO	U
Phosphorus as P	<0.012	mg/L					03/01/2024	AMO	U
LCS (B240695-BS1)									
Calcium			102	85-115			03/01/2024	AMO	
Magnesium			101	85-115			03/01/2024	AMO	
Phosphorus as P			108	85-115			03/01/2024	AMO	
Duplicate (B240695-DUP1) Source ID: AC00337-02									
Calcium					0.727	20	03/01/2024	AMO	
Magnesium					0.793	20	03/01/2024	AMO	
Phosphorus as P					0.100	20	03/01/2024	AMO	
Matrix Spike (B240695-MS1) Source ID: AC00337-02									
Calcium			102	70-130			03/01/2024	AMO	
Magnesium			99.6	70-130			03/01/2024	AMO	
Phosphorus as P			112	70-130			03/01/2024	AMO	
Matrix Spike Dup (B240695-MSD1) Source ID: AC00337-02									
Calcium			101	70-130	0.172	20	03/01/2024	AMO	
Magnesium			99.4	70-130	0.180	20	03/01/2024	AMO	
Phosphorus as P			113	70-130	0.221	20	03/01/2024	AMO	
Batch: B240750									
Blank (B240750-BLK1)									
Arsenic	<0.070	ug/L					03/03/2024	DMW	U
Cadmium	<0.010	ug/L					03/03/2024	DMW	U
Lead	<0.010	ug/L					03/03/2024	DMW	U
LCS (B240750-BS1)									
Arsenic			102	85-115			03/03/2024	DMW	
Cadmium			105	85-115			03/03/2024	DMW	
Lead			107	85-115			03/03/2024	DMW	
Duplicate (B240750-DUP1) Source ID: AC00336-01									
Arsenic					1.36	20	03/03/2024	DMW	
Cadmium					9.29	20	03/03/2024	DMW	
Lead					0.499	20	03/03/2024	DMW	
Matrix Spike (B240750-MS1) Source ID: AC00336-01									
Arsenic			98.2	70-130			03/03/2024	DMW	
Cadmium			100	70-130			03/03/2024	DMW	
Lead			96.4	70-130			03/03/2024	DMW	
Matrix Spike Dup (B240750-MSD1) Source ID: AC00336-01									
Arsenic			98.3	70-130	0.110	20	03/03/2024	DMW	
Cadmium			103	70-130	3.09	20	03/03/2024	DMW	
Lead			97.5	70-130	0.693	20	03/03/2024	DMW	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B240817									
Blank (B240817-BLK1)									
Mercury	<0.01	ug/L					03/08/2024	SAS	U
LCS (B240817-BS1)									
Mercury			102	85-115			03/08/2024	SAS	
Duplicate (B240817-DUP1) Source ID: AC00336-01									
Mercury					1.32	20	03/08/2024	SAS	
Duplicate (B240817-DUP2) Source ID: BB03624-03									
Mercury					NR	20	03/08/2024	SAS	
Matrix Spike (B240817-MS1) Source ID: AC00336-01									
Mercury			99.4	70-130			03/08/2024	SAS	
Matrix Spike (B240817-MS2) Source ID: BB03624-03									
Mercury			106	70-130			03/08/2024	SAS	
Matrix Spike Dup (B240817-MSD1) Source ID: AC00336-01									
Mercury			98.6	70-130	0.699	20	03/08/2024	SAS	
Matrix Spike Dup (B240817-MSD2) Source ID: BB03624-03									
Mercury			107	70-130	0.600	20	03/08/2024	SAS	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B240802									
Blank (B240802-BLK1)									
Copper	<0.15	ug/L					03/08/2024	DMW	U
Zinc	<0.50	ug/L					03/08/2024	DMW	U
LCS (B240802-BS1)									
Copper			91.8	85-115			03/08/2024	DMW	
Zinc			93.3	85-115			03/08/2024	DMW	
Duplicate (B240802-DUP1) Source ID: AC00337-03									
Copper					1.42	10	03/08/2024	DMW	
Zinc					1.17	10	03/08/2024	DMW	
Matrix Spike (B240802-MS1) Source ID: AC00337-03									
Copper			90.6	70-130			03/08/2024	DMW	
Zinc			89.1	70-130			03/08/2024	DMW	
Matrix Spike Dup (B240802-MSD1) Source ID: AC00337-03									
Copper			89.4	70-130	0.854	10	03/08/2024	DMW	
Zinc			86.0	70-130	1.20	10	03/08/2024	DMW	
Batch: B241178									
Blank (B241178-BLK1)									
Cadmium	<0.010	ug/L					04/04/2024	DMW	U
Lead	<0.0090	ug/L					04/04/2024	DMW	U
LCS (B241178-BS1)									
Cadmium			99.9	85-115			04/04/2024	DMW	
Lead			99.4	85-115			04/04/2024	DMW	
Duplicate (B241178-DUP1) Source ID: AC00340-01									
Cadmium					NR	10	04/04/2024	DMW	U
Lead					2.01	10	04/04/2024	DMW	
Matrix Spike (B241178-MS1) Source ID: AC00340-01									
Cadmium			102	70-130			04/04/2024	DMW	
Lead			98.4	70-130			04/04/2024	DMW	
Matrix Spike Dup (B241178-MSD1) Source ID: AC00340-01									
Cadmium			102	70-130	0.490	10	04/04/2024	DMW	
Lead			98.3	70-130	0.146	10	04/04/2024	DMW	

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Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418

Tel. (208) 387-6269

Fax (208) 387-6391

Purchase Order:

63065628

Project:

Stormwater-PI

Sampler(s):

Kristen Chisholm
Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	Water	Grab	Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - BECK-Gottfert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Contaminants
✓ AC00 337-01	2/26/24	2/26/24	0905	1534	240226-03-WC 4.8°C	ST	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
✓ -02	2/26/24	2/26/24	0923	1908	240226-11-WC 6.4°C 57.2°C	ST	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
✓ -03	2/25/24	2/26/24	2238	1601	240226-12-WC 8.4°C 7.2°C	ST	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
✓ -04	2/26/24	2/26/24	0857	1606	240226-14-WC 7.4°C 56°C	ST	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristen Chisholm	2/26/24 2057	Roz 2-27-24 0705	If low volume for 240226-03-WC, please prioritize NOx + Diss Cd, Cu, Pb, Zn, & Orthophosphate.

ACHD SAMPLE FILTRATION, SPLITTING, AND COMPOSITING FOR METALS

PAGE 1 OF 2

Sample	Split/Filter Info	Filter Used	Bottle/Lid Lots	Bottles Split	Comments
Lims#: AC000337-01 Location: <u>-03</u> Sample Date: 2-26-24 Sample ID: ACSTIC #1	Split <u>7</u> Date: 2-26-24 (P) Start Split: <u>C 726</u> Start Filter: <u>0726</u> Comp Time: <u>N/A</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-cap. ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00051-25</u> Comp Jug: <u>N/A</u> SS Tubing: CC00051-28 SS Helper: SSA1 Stir Bar: CC00040-46 Connector: CC00044-99 (x2)	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☒ <u>IC(F)</u> ☐ _____	Prioritize NO _x , Diss, metals & DRP per ACHD.
Lims#: AC000337-02 Location: <u>-11</u> Sample Date: 2-26-24 Sample ID: ACSTIC #2	Split <u>7</u> Date: 2-26-24 (P) Start Split: <u>0744</u> Start Filter: <u>0744</u> Comp Time: <u>0739</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-cap. ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00048-77</u> Comp Jug: <u>CC00051-37</u> SS Tubing: CC00051-28 SS Helper: SSA4 Stir Bar: CC00040-41 31-41 Connector: CC00044-99/48-69	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☒ <u>IC(F)</u> ☐ _____	2 jugs composited into 40L
Lims#: AC000337-03 Location: <u>-12</u> Sample Date: 2-26-24 Sample ID: ACSTIC #3	Split <u>7</u> Date: 2-26-24 (P) Start Split: <u>0823</u> Start Filter: <u>0823</u> Comp Time: <u>0819</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-cap. ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00051-25</u> Comp Jug: <u>CC00051-25</u> SS Tubing: CC00051-28 SS Helper: SSA5 Stir Bar: CC00051-26 Connector: CC00044-99/48-69	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☒ <u>IC(F)</u> ☐ _____	2 jugs composited into 16L
Lims#: AC000337-04 Location: <u>-14</u> Sample Date: 2-26-24 Sample ID: ACSTIC #4	Split <u>7</u> Date: 2-26-24 (P) Start Split: <u>0803</u> Start Filter: <u>0803</u> Comp Time: <u>0759</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-cap. ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00048-77</u> Comp Jug: <u>CC00051-37</u> SS Tubing: CC00051-28 SS Helper: SSA7 Stir Bar: CC00051-28 Connector: CC00048-69 (x2)	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☒ <u>IC(F)</u> ☐ _____	2 jugs composited into 40L
Lims#: AC000336-01 Location: <u>-206</u> Sample Date: 2-26-24 Sample ID: ACSTIC #5	Split <u>7</u> Date: 2-26-24 (P) Start Split: <u>0833</u> Start Filter: <u>0833</u> Comp Time: <u>0834</u> Analyst: <u>AMO/DKT</u>	Filter: ☒ Voss ☒ 0.45µm high-cap. ☒ 5.0µm ☒ 10.0µm	Coll Jug: <u>CC00051-38</u> Comp Jug: <u>CC00051-38</u> SS Tubing: CC00051-28 SS Helper: SSA8 Stir Bar: CC00051-36 Connector: CC00048-69 (x2)	☒ Teflon Total ☒ Teflon Diss (F) ☒ Hg CVAA ☒ BOD ☒ TSS ☒ TDS ☒ COD ☒ TKN ☒ NH ₃ ☒ NO _x (F) ☒ ortho-P (F) ☒ Turb ☒ <u>IC(F)</u> ☐ _____	2 jugs composited into 16L used 2nd set of Voss filters (+3), connector cont 2's - CC00051-27 (x2)

* ASE and SMC observed splitting

Report Date: 04/11/2024 08:19

Revised Report



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Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00336-01	ACST1C	240226-206-WC	Water		02/26/2024	02/27/2024

Comments:

Container temps: #1 - 7.0 C, #2 - 8.1 C

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Analysis Report

Location: ACST1C

Location Description: 240226-206-WC

Date/Time Collected: 02/26/2024 10:04 - 02/26/2024 16:20

Lab Number: AC00336-01

Sample Collector: S.T

Sample Type: Composite

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B240744	0.522	mg/L	0.0500	0.0500	SM 4500-NH3 D-2011	03/01/24	3/1/24 11:42	MEC	
BOD5	B240684	17.7	mg/L	2.00	2.00	SM 5210 B-2016	02/27/24	3/3/24 11:26	BAK	
Chloride	B240796	9.39	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	03/06/24	3/6/24 21:58	ALN	
COD	B240680	122	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	02/27/24	2/27/24 11:18	MCB	
Nitrate-Nitrite, as N	B240718	0.278	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	02/29/24	2/29/24 12:13	LRF	
TKN	B240816	2.43	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	03/07/24	3/8/24 9:44	JAL	
Total Dissolved Solids	B240696	85.8	mg/L	20.0	20.0	SM 2540 C-2015	02/28/24	2/29/24 13:58	MEC	
Total Suspended Solids	B240683	75.8	mg/L	0.900	0.900	SM 2540 D-2015	02/27/24	2/27/24 10:39	MEC	
Turbidity	B240698	75.5	NTU	1.2	0.3	EPA 180.1, Rev. 2.0 (1993)	02/28/24	2/28/24 9:41	ASE	D
Dissolved Wet Chemistry										
Orthophosphate, as P	B240685	0.289	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	02/27/24	2/27/24 10:05	RKT	
Total Metals										
Mercury	B240817	0.0183	ug/L	0.0100	0.0100	EPA 245.1	03/07/24	3/8/24 7:58	SAS	
Arsenic	B240750	2.2	ug/L	0.070	0.070	EPA 200.8	03/02/24	3/3/24 13:40	DMW	
Cadmium	B240750	0.087	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:40	DMW	
Calcium	B240695	5.43	mg/L	0.0400	0.0400	EPA 200.7	02/28/24	3/1/24 11:13	AMO	
Lead	B240750	6.3	ug/L	0.010	0.010	EPA 200.8	03/02/24	3/3/24 13:40	DMW	
Magnesium	B240695	2110	ug/L	80.0	80.0	EPA 200.7	02/28/24	3/1/24 11:13	AMO	
Phosphorus as P	B240695	0.570	mg/L	0.0120	0.0120	EPA 200.7	02/28/24	3/1/24 11:13	AMO	
Hardness	B240695	22.2	mg/L	0.100	0.100	SM 2340 B-2011	02/28/24	3/1/24 11:13	AMO	
Dissolved Metals										
Cadmium	B241178	0.016	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 16:02	DMW	
Copper	B240802	5.0	ug/L	0.15	0.15	EPA 200.8	03/08/24	3/8/24 16:25	DMW	
Lead	B241178	0.26	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 16:02	DMW	
Zinc	B240802	20.2	ug/L	0.50	0.50	EPA 200.8	03/08/24	3/8/24 16:25	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B240680									
Blank (B240680-BLK1) COD	<7	mg/L					02/27/2024	MCB	U
LCS (B240680-BS1) COD			100	90-110			02/27/2024	MCB	
Duplicate (B240680-DUP1) COD	Source ID: AC00335-01				3.92	10	02/27/2024	MCB	
Batch: B240683									
Blank (B240683-BLK1) Total Suspended Solids	<0.9	mg/L					02/27/2024	MEC	U
LCS (B240683-BS1) Total Suspended Solids			101	90-110			02/27/2024	MEC	
Duplicate (B240683-DUP1) Total Suspended Solids	Source ID: BB03630-02				8.03	20	02/27/2024	MEC	
Batch: B240684									
Blank (B240684-BLK1) BOD5	<2	mg/L					03/03/2024	BAK	U
LCS (B240684-BS1) BOD5			102	84.6-115.4			03/03/2024	BAK	
LCS (B240684-BS2) BOD5			109	84.6-115.4			03/03/2024	BAK	
Duplicate (B240684-DUP1) BOD5	Source ID: BB03630-03				3.10	30	03/03/2024	BAK	
Batch: B240696									
Blank (B240696-BLK1) Total Dissolved Solids	<20	mg/L					02/29/2024	MEC	U
LCS (B240696-BS1) Total Dissolved Solids			99.4	90-110			02/29/2024	MEC	
Duplicate (B240696-DUP1) Total Dissolved Solids	Source ID: LS01873-01				0.700	10	02/29/2024	MEC	

Revised Report



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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240698									
Blank (B240698-BLK1)									
Turbidity	<0.3	NTU					02/28/2024	ASE	U
LCS (B240698-BS1)									
Turbidity			98.2	90-110			02/28/2024	ASE	
Duplicate (B240698-DUP1) Source ID: AC00337-04									
Turbidity					3.45	25	02/28/2024	ASE	D
Batch: B240718									
Blank (B240718-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					02/29/2024	LRF	U
Blank (B240718-BLK2)									
Nitrate-Nitrite, as N	<0.025	mg/L					02/29/2024	LRF	U
LCS (B240718-BS1)									
Nitrate-Nitrite, as N			104	90-110			02/29/2024	LRF	
LCS (B240718-BS2)									
Nitrate-Nitrite, as N			99.7	90-110			02/29/2024	LRF	
Duplicate (B240718-DUP1) Source ID: BB03631-02									
Nitrate-Nitrite, as N					NR	10	02/29/2024	LRF	
Duplicate (B240718-DUP2) Source ID: AC00336-01									
Nitrate-Nitrite, as N					0.514	10	02/29/2024	LRF	
Duplicate (B240718-DUP3) Source ID: LS01875-02									
Nitrate-Nitrite, as N					0.470	10	02/29/2024	LRF	
Matrix Spike (B240718-MS1) Source ID: BB03631-02									
Nitrate-Nitrite, as N			101	90-110			02/29/2024	LRF	
Matrix Spike (B240718-MS2) Source ID: AC00336-01									
Nitrate-Nitrite, as N			99.9	90-110			02/29/2024	LRF	
Matrix Spike (B240718-MS3) Source ID: LS01875-02									
Nitrate-Nitrite, as N			98.2	90-110			02/29/2024	LRF	
Matrix Spike Dup (B240718-MSD1) Source ID: BB03631-02									
Nitrate-Nitrite, as N			106	90-110	4.55	10	02/29/2024	LRF	
Matrix Spike Dup (B240718-MSD2) Source ID: AC00336-01									
Nitrate-Nitrite, as N			99.9	90-110	0.0278	10	02/29/2024	LRF	
Matrix Spike Dup (B240718-MSD3) Source ID: LS01875-02									
Nitrate-Nitrite, as N			97.3	90-110	0.479	10	02/29/2024	LRF	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240744									
Blank (B240744-BLK1)									
Ammonia, as N	<50	ug/L					03/01/2024	MEC	U
LCS (B240744-BS1)									
Ammonia, as N			97.7	90-110			03/01/2024	MEC	
Duplicate (B240744-DUP1) Source ID: LS01873-02									
Ammonia, as N					1.34	10	03/01/2024	MEC	
Duplicate (B240744-DUP2) Source ID: BB03629-03									
Ammonia, as N					1.56	10	03/01/2024	MEC	
Matrix Spike (B240744-MS1) Source ID: LS01873-02									
Ammonia, as N			98.3	80-120			03/01/2024	MEC	
Matrix Spike (B240744-MS2) Source ID: BB03629-03									
Ammonia, as N			104	80-120			03/01/2024	MEC	
Matrix Spike Dup (B240744-MSD1) Source ID: LS01873-02									
Ammonia, as N			100	80-120	1.38	10	03/01/2024	MEC	
Matrix Spike Dup (B240744-MSD2) Source ID: BB03629-03									
Ammonia, as N			106	80-120	1.01	10	03/01/2024	MEC	
Batch: B240796									
Blank (B240796-BLK1)									
Chloride	<0.015	mg/L					03/06/2024	ALN	U
Blank (B240796-BLK2)									
Chloride	<0.015	mg/L					03/07/2024	ALN	U
LCS (B240796-BS1)									
Chloride			95.7	90-110			03/06/2024	ALN	
LCS (B240796-BS2)									
Chloride			96.0	90-110			03/06/2024	ALN	
LCS (B240796-BS3)									
Chloride			95.4	90-110			03/07/2024	ALN	
Duplicate (B240796-DUP1) Source ID: RW00054-10									
Chloride					3.94	10	03/07/2024	ALN	D
Duplicate (B240796-DUP2) Source ID: RW00056-07									
Chloride					0.398	10	03/07/2024	ALN	D
Duplicate (B240796-DUP3) Source ID: AC00337-01									
Chloride					0.672	10	03/06/2024	ALN	
Duplicate (B240796-DUP4) Source ID: LS01873-01									
Chloride					0.319	10	03/07/2024	ALN	D
Matrix Spike (B240796-MS1) Source ID: RW00054-10									
Chloride			96.6	90-110			03/07/2024	ALN	D
Matrix Spike (B240796-MS2) Source ID: RW00056-07									
Chloride			94.1	90-110			03/07/2024	ALN	D

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B240796 (Continued)									
Matrix Spike (B240796-MS3) Chloride	Source ID: AC00337-01		93.9	90-110			03/06/2024	ALN	
Matrix Spike (B240796-MS4) Chloride	Source ID: LS01873-01		94.6	90-110			03/07/2024	ALN	D
Matrix Spike Dup (B240796-MSD1) Chloride	Source ID: RW00054-10		97.2	90-110	0.377	10	03/07/2024	ALN	D
Matrix Spike Dup (B240796-MSD2) Chloride	Source ID: RW00056-07		94.2	90-110	0.0228	10	03/07/2024	ALN	D
Matrix Spike Dup (B240796-MSD3) Chloride	Source ID: AC00337-01		97.5	90-110	2.75	10	03/07/2024	ALN	
Matrix Spike Dup (B240796-MSD4) Chloride	Source ID: LS01873-01		95.4	90-110	0.336	10	03/07/2024	ALN	D
Batch: B240816									
Blank (B240816-BLK1) TKN		<0.1 mg/L					03/08/2024	JAL	U
Blank (B240816-BLK2) TKN		<0.1 mg/L					03/08/2024	JAL	U
Blank (B240816-BLK3) TKN		<0.1 mg/L					03/08/2024	JAL	U
LCS (B240816-BS1) TKN			96.1	80-120			03/08/2024	JAL	
LCS (B240816-BS2) TKN			105	80-120			03/08/2024	JAL	
LCS (B240816-BS3) TKN			104	80-120			03/08/2024	JAL	
Duplicate (B240816-DUP1) TKN	Source ID: BB03631-02				1.33	20	03/08/2024	JAL	D
Duplicate (B240816-DUP2) TKN	Source ID: BB03638-01				1.21	20	03/08/2024	JAL	D
Duplicate (B240816-DUP3) TKN	Source ID: LS01875-05				1.25	20	03/08/2024	JAL	D
Matrix Spike (B240816-MS1) TKN	Source ID: BB03631-02		106	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS2) TKN	Source ID: BB03638-01		107	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS3) TKN	Source ID: LS01875-05		108	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS4) TKN	Source ID: RW00055-01		107	80-120			03/08/2024	JAL	D

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier

Wet Chemistry (Continued)**Batch: B240816 (Continued)**

Matrix Spike (B240816-MS5) TKN	Source ID: RW00055-03		105	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS6) TKN	Source ID: RW00055-04		103	80-120			03/08/2024	JAL	D
Matrix Spike (B240816-MS7) TKN	Source ID: RW00055-06		102	80-120			03/08/2024	JAL	D
Matrix Spike Dup (B240816-MSD1) TKN	Source ID: BB03631-02		114	80-120	2.56	20	03/08/2024	JAL	D
Matrix Spike Dup (B240816-MSD2) TKN	Source ID: BB03638-01		115	80-120	2.66	20	03/08/2024	JAL	D
Matrix Spike Dup (B240816-MSD3) TKN	Source ID: LS01875-05		114	80-120	2.43	20	03/08/2024	JAL	D

Dissolved Wet Chemistry**Batch: B240685**

Blank (B240685-BLK1) Orthophosphate, as P		<0.003	mg/L				02/27/2024	RKT	U
LCS (B240685-BS1) Orthophosphate, as P			96.3	90-110			02/27/2024	RKT	
Duplicate (B240685-DUP1) Orthophosphate, as P	Source ID: LS01873-02				0.0687	10	02/27/2024	RKT	D
Duplicate (B240685-DUP3) Orthophosphate, as P	Source ID: RW00054-07RE1				0.433	10	02/27/2024	RKT	D
Matrix Spike (B240685-MS1) Orthophosphate, as P	Source ID: LS01873-02		98.4	90-110			02/27/2024	RKT	D
Matrix Spike (B240685-MS3) Orthophosphate, as P	Source ID: RW00054-07RE1		101	90-110			02/27/2024	RKT	D
Matrix Spike Dup (B240685-MSD1) Orthophosphate, as P	Source ID: LS01873-02		98.5	90-110	0.0349	10	02/27/2024	RKT	D
Matrix Spike Dup (B240685-MSD3) Orthophosphate, as P	Source ID: RW00054-07RE1		101	90-110	0.0489	10	02/27/2024	RKT	D

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B240695									
Blank (B240695-BLK1)									
Calcium	<0.04	mg/L					03/01/2024	AMO	U
Magnesium	<80	ug/L					03/01/2024	AMO	U
Phosphorus as P	<0.012	mg/L					03/01/2024	AMO	U
LCS (B240695-BS1)									
Calcium			102	85-115			03/01/2024	AMO	
Magnesium			101	85-115			03/01/2024	AMO	
Phosphorus as P			108	85-115			03/01/2024	AMO	
Duplicate (B240695-DUP1) Source ID: AC00337-02									
Calcium					0.727	20	03/01/2024	AMO	
Magnesium					0.793	20	03/01/2024	AMO	
Phosphorus as P					0.100	20	03/01/2024	AMO	
Matrix Spike (B240695-MS1) Source ID: AC00337-02									
Calcium			102	70-130			03/01/2024	AMO	
Magnesium			99.6	70-130			03/01/2024	AMO	
Phosphorus as P			112	70-130			03/01/2024	AMO	
Matrix Spike Dup (B240695-MSD1) Source ID: AC00337-02									
Calcium			101	70-130	0.172	20	03/01/2024	AMO	
Magnesium			99.4	70-130	0.180	20	03/01/2024	AMO	
Phosphorus as P			113	70-130	0.221	20	03/01/2024	AMO	
Batch: B240750									
Blank (B240750-BLK1)									
Arsenic	<0.070	ug/L					03/03/2024	DMW	U
Cadmium	<0.010	ug/L					03/03/2024	DMW	U
Lead	<0.010	ug/L					03/03/2024	DMW	U
LCS (B240750-BS1)									
Arsenic			102	85-115			03/03/2024	DMW	
Cadmium			105	85-115			03/03/2024	DMW	
Lead			107	85-115			03/03/2024	DMW	
Duplicate (B240750-DUP1) Source ID: AC00336-01									
Arsenic					1.36	20	03/03/2024	DMW	
Cadmium					9.29	20	03/03/2024	DMW	
Lead					0.499	20	03/03/2024	DMW	
Matrix Spike (B240750-MS1) Source ID: AC00336-01									
Arsenic			98.2	70-130			03/03/2024	DMW	
Cadmium			100	70-130			03/03/2024	DMW	
Lead			96.4	70-130			03/03/2024	DMW	
Matrix Spike Dup (B240750-MSD1) Source ID: AC00336-01									
Arsenic			98.3	70-130	0.110	20	03/03/2024	DMW	
Cadmium			103	70-130	3.09	20	03/03/2024	DMW	
Lead			97.5	70-130	0.693	20	03/03/2024	DMW	

Revised Report



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B240817									
Blank (B240817-BLK1)									
Mercury	<0.01	ug/L					03/08/2024	SAS	U
LCS (B240817-BS1)									
Mercury			102	85-115			03/08/2024	SAS	
Duplicate (B240817-DUP1) Source ID: AC00336-01									
Mercury					1.32	20	03/08/2024	SAS	
Duplicate (B240817-DUP2) Source ID: BB03624-03									
Mercury					NR	20	03/08/2024	SAS	
Matrix Spike (B240817-MS1) Source ID: AC00336-01									
Mercury			99.4	70-130			03/08/2024	SAS	
Matrix Spike (B240817-MS2) Source ID: BB03624-03									
Mercury			106	70-130			03/08/2024	SAS	
Matrix Spike Dup (B240817-MSD1) Source ID: AC00336-01									
Mercury			98.6	70-130	0.699	20	03/08/2024	SAS	
Matrix Spike Dup (B240817-MSD2) Source ID: BB03624-03									
Mercury			107	70-130	0.600	20	03/08/2024	SAS	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B240802									
Blank (B240802-BLK1)									
Copper	<0.15	ug/L					03/08/2024	DMW	U
Zinc	<0.50	ug/L					03/08/2024	DMW	U
LCS (B240802-BS1)									
Copper			91.8	85-115			03/08/2024	DMW	
Zinc			93.3	85-115			03/08/2024	DMW	
Duplicate (B240802-DUP1) Source ID: AC00337-03									
Copper					1.42	10	03/08/2024	DMW	
Zinc					1.17	10	03/08/2024	DMW	
Matrix Spike (B240802-MS1) Source ID: AC00337-03									
Copper			90.6	70-130			03/08/2024	DMW	
Zinc			89.1	70-130			03/08/2024	DMW	
Matrix Spike Dup (B240802-MSD1) Source ID: AC00337-03									
Copper			89.4	70-130	0.854	10	03/08/2024	DMW	
Zinc			86.0	70-130	1.20	10	03/08/2024	DMW	
Batch: B241178									
Blank (B241178-BLK1)									
Cadmium	<0.010	ug/L					04/04/2024	DMW	U
Lead	<0.0090	ug/L					04/04/2024	DMW	U
LCS (B241178-BS1)									
Cadmium			99.9	85-115			04/04/2024	DMW	
Lead			99.4	85-115			04/04/2024	DMW	
Duplicate (B241178-DUP1) Source ID: AC00340-01									
Cadmium					NR	10	04/04/2024	DMW	U
Lead					2.01	10	04/04/2024	DMW	
Matrix Spike (B241178-MS1) Source ID: AC00340-01									
Cadmium			102	70-130			04/04/2024	DMW	
Lead			98.4	70-130			04/04/2024	DMW	
Matrix Spike Dup (B241178-MSD1) Source ID: AC00340-01									
Cadmium			102	70-130	0.490	10	04/04/2024	DMW	
Lead			98.3	70-130	0.146	10	04/04/2024	DMW	

Revised Report



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Water Quality Laboratory
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Notes and Definitions

Item	Definition
D	Data reported from a dilution
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Janet Finegan-Kelly
Water Quality Laboratory Manager


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

Ada County Highway District

Attn: Steven Turner
 3775 Adams Street
 Garden City, Idaho 83714-6418
 Tel. (208) 387-6269
 Fax (208) 387-6391
 Purchase Order:
 Project:
 Sampler(s):

63065628

Stormwater-PI

Kristin Clushelm
 Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 246.2	E. Coli - IDEXX-Gallert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ - D	Total Contaminants
✓ AC0033601	2/26/24	2/26/24	1004	1620	240226-206-WC 7.0°C & 8.1°C	ST	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2

BC 245.1
 EPA 300.0

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristin Clushelm	2/26/24 2:58	Steve 2-27-24 07:05	



Technical Memorandum

1290 W. Myrtle St. Suite 340
Boise, ID 83702

Phone: 801.316.9859

Prepared for: Ada County Highway District
Project Title: NPDES Phase I Stormwater Support WY 2024
Project No.: 159103

Technical Memorandum

Subject: ACHD Phase I Storm Event Report for March 28, 2024
Date: June 20, 2024
To: Monica Lowe
Cc: Steven Turner
Kristen Chisholm
From: Zuly Lapa, Project Engineer

Prepared by: Zuly Lapa, EIT, Project Engineer

Reviewed by: Melissa Jannusch, PE, Project Manager

Limitations:

This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated October 10, 2023. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

The Environmental Protection Agency Region 10 reissued a Municipal Separate Storm Sewer System Phase I National Pollutant Discharge Elimination System Permit (NPDES) Permit, effective October 1, 2021, to Ada County Highway District (ACHD), Boise City, Ada County Drainage District No. 3, Idaho Transportation Department District 3, Boise State University, and Garden City. Under the NPDES Permit, Permittees are required to continue to conduct wet weather stormwater outfall monitoring and subwatershed monitoring. Four outfall monitoring sites (Lucky, Whitewater, Main, and Americana) and one subwatershed monitoring site (AS_6) have been established. The AS_6 site represents a subwatershed located within the Americana watershed. At each site, a minimum of three composite and three grab samples will be collected during Water Year (WY) 2024 (October 1, 2023, through September 30, 2024). The following storm event report summarizes stormwater sampling results from the March 28, 2024, storm event.

Section 2: Project Status

Table 2-1 is a summary of the sample types collected to date for WY 2024 Phase I Stormwater Outfall Monitoring. When samples are qualified, additional samples will be attempted from subsequent storms to collect unqualified samples.

Table 2-1. WY 2024 Samples Collected					
Date	Lucky	Whitewater	Main	Americana	AS_6
October 10, 2023	G, C ^{1,2}	G	--	G, C ³	--
November 19, 2023	G, C	G, C	G, C	G ⁴ , C	G, C
February 1, 2024	G ⁵ , C	G ⁵ , C ⁶	G ⁵ , C	G ⁵ , C	G ⁵ , C
February 26, 2024	G, C	G, C	G, C ⁷	G, C	G, C
March 28, 2024	--	C	G, C	G	G
Unqualified Samples:	3G, 3C	3G, 3C	3G, 3C	3G, 3C	3G, 3C
Samples Remaining:	0G, 0C	0G, 0C	0G, 0C	0G, 0C	0G, 0C

Notes:

-- = no samples taken

C = composite sample

G = grab sample

¹ Composite samples qualified due to lack of representativeness (50%–75%).

² Incomplete water quality analysis due to low composite sample volume.

³ Composite samples qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

⁴ Incomplete field parameter collection on the grab sample data form due to field error.

⁵ E. coli sample qualified due to exceeded hold time.

⁶ Composite sample rejected due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented more than 10% of the composite volume.

⁷ Composite sample qualified due to automatic sampler triggering prior to storm event runoff. The subsamples taken prior to the event represented less than 10% of the composite volume.

Section 3: Storm Event Summary

The March 28, 2024, storm event and the subsequent preparation and sampling efforts are detailed in the following sections.

3.1 Storm Detail

A summary of the forecast on which monitoring decisions were based is detailed below. The sampling event communication form that describes the forecast and summarizes the decision-making process from March 28, 2024, is included in Attachment A for reference.

Wednesday, March 27, 2024 to Thursday, March 28, 2024

- On the morning of March 27, the National Weather Service issued a forecast of rain shadowing and light rain in the Boise area, starting March 27 at 1800 until March 28 at 0300. Rain was predicted to increase until March 28, 2024 at 1000. The chance of precipitation was 90%, with more than 0.1 inches of precipitation forecasted.
- Setup was accomplished in the afternoon of March 27. An expected precipitation depth of 0.11 inches was used to set trigger volumes at monitoring stations. A runoff calculations worksheet showing how the trigger volumes were calculated is included in Attachment A.
- Moderate rain first started at approximately March 27 at 1901 and ended March 28 at 1249.
- Precipitation totals ranged between 0.53 and 0.59 inches at local rain gauges.

Flow measurements and precipitation data are listed in Table 1 along with a sampling summary.

Hydrographs for the Whitewater, Main, Americana and AS_6 sites showing flow, rain, and sample collection data are included in Attachment B.

3.2 Sampling Summary

Whitewater and Main monitoring stations were set up on March 27, to collect flow-proportional composite samples during the storm. Sampler enable conditions were programmed into the Whitewater and Americana flowmeters. A site-specific velocity cutoff value was programmed into Main and AS_6 flowmeter. Setup and sampling information are included in Table 1. The field forms completed during setup/shutdown and sampling are included in Attachment C.

Grab Samples

A two-member team mobilized to collect stormwater runoff grab samples and verify operation of the automatic sampling equipment on March 28 around 0131. Grab samples for Main, Americana, and AS_6 was submitted to the West Boise Water Quality Lab (WQL) at 0816 on March 28.

Results for grab samples, including field parameter and analytical data, are included in Table 2. Laboratory analytical reports are included in Attachment D.

Composite Samples

Composite samples were collected at the Main monitoring station and submitted to the WQL at 1134 on March 28. The composite sample at Whitewater monitoring station was submitted at 1314 on March 28 to the WQL.

Analytical results are shown in Table 2 and pollutant loading estimates for the event are detailed in Table 3. Laboratory analytical reports are included in Attachment D.

Section 4: Quality Assurance/Quality Control

A summary of quality control samples collected during the March 28, 2024, storm event is presented below in Table 4-1. A field blank and a field duplicate were collected from the Main monitoring station. A field blank composite sample was collected from the Americana monitoring station. The analytical results for these samples are included in Table 4.

Table 4-1. Quality Control Samples			
Sample ID	Sample Type	Parent Sample	Conclusions
240328-12-001	Field blank	Main grab	No <i>E. coli</i> detection was reported in the field blank.
240328-12-101	Field duplicate	Main grab	Relative percent difference was within the acceptable range.
240328-14-002	Field blank composite	None	No composite parameter detection was reported on the field blank composite.

Data quality objectives for this storm were evaluated and tracked using the data validation review checklist included in Attachment A. Performance criteria for analytical and non-analytical data was met for this storm event.

Section 5: Notes and Recommendations

Whitewater

At Whitewater, composite sample bottle 3 had a power failed error message from 0405 until 0407 on March 28, due to the battery on the sampler running low. The error message was present for the last four subsamples in bottle 3. The battery was replaced prior to installing bottle 4, resolving the error message.

Data Tables



TAB-1

Table 1. Sampling and Flow Summary

	Lucky	Whitewater	Main	Americana	AS_6
Grab samples collected and submitted?	NO	NO	YES	YES	YES
Composite samples collected and submitted?	NO	YES	YES	NO	NO
Trigger volume (ft ³)	--	800 cf	3411 gal	--	--
Velocity cutoff (fps)	--	--	--	--	--
Sampler enable condition (in)	--	Level > 3.3 "	Level > 1.84 "	--	--
Runoff start time	--	1919 ¹	1911 ¹	1901 ¹	1930 ¹
Grab sample collection time	--	--	0137	0159	0219
Composite sample stop time	--	1133	0739	--	--
Runoff stop time	--	1249 ²	0817 ²	0928 ²	1013 ²
Volume of discharge sampled (ft ³)	--	127,090	37,197	--	--
Total runoff volume (ft ³)	--	154,801	48,613	372,974	37,320
Percent of storm flow sampled (%)	--	82%	77%	--	--
Composite sample duration (hrs)	--	13	11	--	--
Storm Precipitation (in)	0.53	0.59	0.53	0.53/0.56	0.53/0.56
Referenced Rain Gauge	Cynthia Mann	Whitewater	Front	Front/East	Front/East
Sampler messages (counts): Success	--	159	70	--	--
Number of composite bottles filled	--	8	3	--	--
Composite sample volume (Approx.; ml)	--	88,300 ml	40,500 ml	--	--

Notes:

-- = No data.

¹ Storm runoff started on 3/27/2024.

² Storm runoff ended on 3/28/2024.

Table 2. Field and Analytical Data Summary																											
Monitoring Station	Sample Date	Sample ID Grab	Field Parameters				E. coli mpn/100 mL	Sample ID Composite	Analytical Parameters																		
			Dissolved Oxygen	pH	Conductivity	Temperature			BOD ₅	COD	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	uS/cm	C			mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lucky	3/28/2024	240328-03-WG	--	--	--	--	--	240328-03-WC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Whitewater	3/28/2024	240328-11-WG	--	--	--	--	--	240328-11-WC	8.20	84.0	31.9	26.2	131	76.0	0.318	0.131	0.236	0.277	1.63	2.0	<0.0100	0.074	1.9	0.097	5.8	0.0151	9.80
Main	3/28/2024	240328-12-WG	10.02	7.82	116.08	10.91	21.6	240328-12-WC	5.03	104	12.6	24.6	91.7	44.2	0.145	0.0494	0.293	0.151	1.18	1.1	<0.0100	0.071	2.3	0.068	5.9	0.0171	14.7
Americana	3/28/2024	240328-14-WG	10.57	7.28	255.40	9.79	365.4	240328-14-WC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
AS_6	3/28/2024	240328-206-WG	9.92	7.60	108.59	7.74	387.3	240328-206-WC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

Notes:
 -- = No data.

Table 3. Event Pollutant Loading Estimates in Pounds						
Monitoring Station	Event Date	TSS	Total Phosphorus	Ammonia as N	Nitrate + Nitrite as N	TKN
Lucky	3/28/2024	--	--	--	--	--
Whitewater	3/28/2024	1266	3.07	2.28	2.68	15.7
Main	3/28/2024	278.2	0.440	0.889	0.458	3.58
Americana	3/28/2024	--	--	--	--	--
AS_6	3/28/2024	--	--	--	--	--

Notes:

-- = No data.

Table 4. QC Sample Summary																							
Date	Parent Sample	Sample ID	Type	E. coli	BOD ₅	COD	Hardness as CaCO3	Turbidity	TSS	TDS	Total Phosphorus	Dissolved Orthophosphate	Ammonia	Nitrate + Nitrite (N)	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
				mpn/100 mL	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
3/28/2024	240328-12-WG	240328-12-001	Field Blank	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3/28/2024	240328-12-WG	240328-12-101	Field Duplicate	17.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calculated parent/duplicate RPD				5%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Allowable RPD				40%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
3/28/2024	--	240328-14-002	Field Blank Composite	--	<2.00	<7.00	<0.100	<0.3	<0.900	<20.0	<0.0120	<3.00E-3	<0.0450	<0.0250	<0.100	<0.0700	<0.0100	<0.0100	<0.150	<9.00E-3	<0.0100	<0.0100	<0.500

Notes:
-- = No data.

Attachment A: Supplemental Documents

Sampling Event Communication Form

Data Validation Checklist

Runoff Calculation Worksheet

SAMPLING EVENT COMMUNICATION FORM

Date: 03/27/2024	Time: 8:10 AM	Initials: ST
Is there a targeted sampling event during the next 36 hours? (Or, if it is Friday, is a targeted event expected before 5:00 PM Monday?)		Maybe

Past 72 hr Precip	0.08" at airport
Date and time of expected event	3/28/24 @ 3:00 am
Expected amount of precipitation	0.16"
Percent chance of precipitation	94%
Percent chance of >0.10" over 12 hours	90%

NWS Update

Spoke with Les from NWS and he said the main band of the rain will start around 3:00 AM with some light sprinkles around 6:00 pm on 3/27/24 resulting from rain shadowing. The total rain from 6:00 PM (3/27) – 3:00 AM (3/28) will be 0.02". There will be constant showers until 10:00 AM and there may be some light sprinkles till 12:00 PM. Theres a 90% chance we will receive over 0.1" of rain.

<u>Targeted Station & Samples</u>					
Lucky ☐ Grab ☐ Composite	Whitewater ☐ Grab ☒ Composite	Main ☒ Grab ☒ Composite	Americana ☒ Grab ☐ Composite	AS_6 ☒ Grab ☐ Composite	State (Phase II) ☒ Grab ☒ Composite

Type of Forecasted Precipitation

☐ Light Rain	☒ Rain	☐ Rain on Snow
☐ Scattered Showers	☐ Thunder Showers	☐ Snowmelt
☐ Other:		

Reasons for Not Targeting a Forecasted Storm and/or Stations

☐ Holiday

☐ Waiting on Antecedent Dry Period – Expires:

☐ Equipment Concerns:

☐ Other:

Text Forecast

NWS Forecast for: 2 Miles NNW Garden City ID
 Issued by: National Weather Service Boise, ID
 Last Update: 3:29 am MST Mar 27, 2024

Today: Scattered showers after noon. Mostly cloudy, with a high near 58. Southeast wind 7 to 14 mph. Chance of precipitation is 30%.

Tonight: Showers. Low around 39. East southeast wind 6 to 13 mph. Chance of precipitation is 90%. New precipitation amounts between a tenth and quarter of an inch possible.

Thursday: Showers likely, with thunderstorms also possible after noon. Mostly cloudy, with a high near 54. Calm wind becoming west 5 to 8 mph in the afternoon. Chance of precipitation is 70%.

Thursday Night: A 20 percent chance of showers before midnight. Mostly cloudy, with a low around 35. West southwest wind around 6 mph becoming east southeast after midnight.

Friday: A 20 percent chance of showers after noon. Partly sunny, with a high near 55. East southeast wind 3 to 7 mph.

Friday Night: Mostly cloudy, with a low around 34.

Saturday: Partly sunny, with a high near 59.

Saturday Night: A 20 percent chance of showers after midnight. Partly cloudy, with a low around 35.
Sunday: A 30 percent chance of showers, mainly before noon. Mostly sunny, with a high near 60.
Sunday Night: Mostly clear, with a low around 34.
Monday: Sunny, with a high near 63.
Monday Night: Mostly clear, with a low around 38.
Tuesday: Sunny, with a high near 71.

Forecast Discussion

Area Forecast Discussion

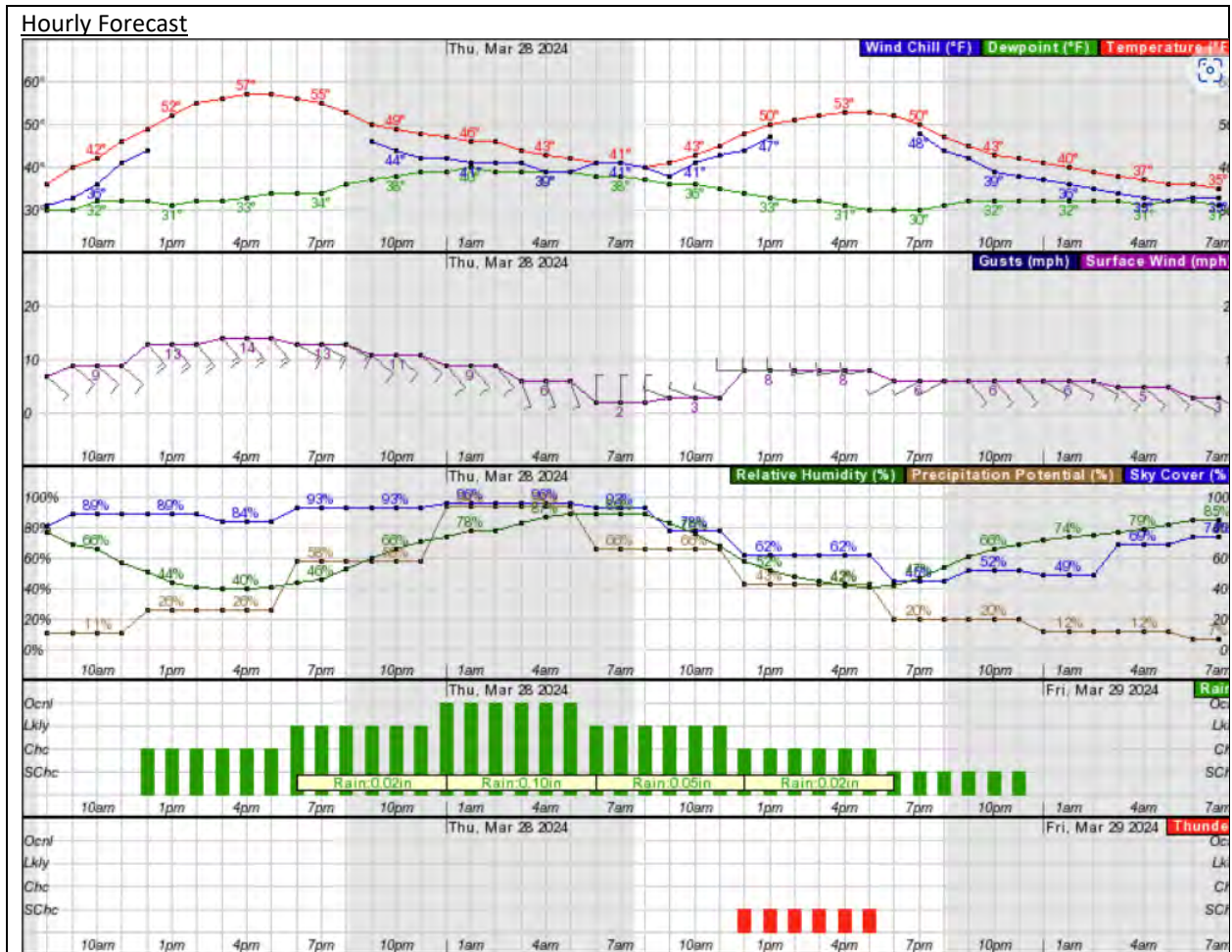
National Weather Service Boise ID
356 AM MDT Wed Mar 27 2024

.SHORT TERM...Today through Friday night...A warm frontal passage this morning will open up into moist southwest aloft this afternoon. Precipitation will initiate over southeast Oregon early in the afternoon, spreading into southwest Idaho by early evening. While the thunderstorm threat today is less than 15% an overlap in daytime heating and increasing instability aloft could support a strike/flash over portions of SE Oregon, mainly Harney/Malheur counties. The increased flow aloft and deep Pacific low will bring breezy conditions today, the strongest winds across southeast Oregon. **Wednesday night is wet across the region as a broad upper low approaches the Pac NW coast.** The mountains of e-central Oregon and w-central Idaho see the focus of heaviest precipitation through Thursday morning where liquid totals of 0.50 to 1.00 inch are expected. Snow levels through Wednesday night will run 5000 to 6000 kft dropping to 3500 to 5000 ft Thursday. Total accumulation of 5 to 10 inches is expected above 6000 ft with up to 2 inches in mountain valleys above 4500 feet. **Lower elevations that stay dry into Wednesday evening will see precipitation fill in overnight with the passage of a cold front. Lower valleys are likely to see 0.10 to 0.20 inch of rain.** The main low will reach the WA coast on Thursday, the accompanying colder air aloft and daytime heating supporting a continued chance of showers and slight chance of thunderstorms. The shower threat retreats to the mountains Thursday night, expanding again on Friday with a 20% chance in the valleys and 40 to 70 percent chance in the mountains.

.LONG TERM...Saturday through Wednesday...The closed upper level low will move to our southwest on Saturday, becoming a positively tilted upper level trough that will keep temperatures cool through the weekend. Lingering moisture with this trough will also allow for a slight chance of precipitation (20-30% chance) over high terrain and near the Nevada border on Saturday and Sunday. Temperatures will be slightly below normal, with snow levels right around 4000-5000 feet. Any snow accumulations will be minimal, with higher elevations in the mountains seeing anywhere from 1-3 inches by Sunday night. This low will begin to move out on Monday, with a deep ridge building in over the region late Monday into Tuesday, bringing above normal temperatures and dry conditions through Wednesday. Tuesday looks to be the warmest day, with temperatures in the valleys reaching the upper 60s and low 70s.

Good model agreement exists with this pattern through next week, with only slight variation in the deterministic model's evolution of the closed low. This accounts for the forecast uncertainty in precipitation this weekend, although all ensembles and deterministic solutions show light precipitation

in the region.



Storm Event QA/QC Checklist – Phase I

STORM DATE		3/28/24								
A. Event and Data Completeness		Yes	No	N/A	Notes					
1. Field data sheets filled out completely and clearly		X								
2. Field parameters reviewed, and any problems/issues addressed		X								
3. All samples collected as specified		X								
4. All samples delivered to lab promptly (review chain of custody rpts)		X								
5. Inconsistencies/clarifications discussed with sampling team member				X						
6. All analytical reports from lab received		X								
B. Validation and Verification Methods		Yes	No	N/A	Notes					
1. Outliers and unexpected values discussed with lab				X						
2. Appropriate analytical methods used		X								
3. All lab QA samples were within method acceptance criteria		X								
4. All samples reviewed and data qualifiers assigned if needed		X								
5. Data quality objective achieved		X								
C. Specific Storm and Sample QA/QC Criteria		Lucky	Whitewater	Main	Americana	AS_6	Program Criteria	Met	Qualify	Reject
1. Antecedent dry period (inches in previous 72-hours)		0.01	0.01	0.00	0.00/0.02	0.00/0.02	< 0.11" in 72 hrs	X		
2. Precipitation (inches)		0.53	0.59	0.53	0.53/0.5	0.53/0.56	> 0.10"	X		
3. Sampled amount (% of total run-off)		—	82%	77%	—	—	>= 75% or >= 6 hrs: no qualifier			
4. Composite sample duration (hours)		—	13	11	—	—	>= 50% and <75%: qualify	X		
							< 50%: reject			
4. Ecoli sample holding time (hours)		—	—	7.0	7.0	6.5	<=8 hrs: no qualifier	X		
							>8 and <=16 hrs.: qualify			
							>16 hrs.: reject			
5. Filtering of samples for dissolved parameter analysis (hours)		—	2.5	5.0	—	—	<= 24 hrs: no qualifier	X		
							> 24 hrs.: reject			
D. Notes										

Reviewed by Steven Turner

Date 5/16/24

Approved by

Monica Rowe

Date

5/17/24

Storm Runoff Estimates and Trigger Volumes

Step 1. Enter runoff coefficients in yellow cells.

Step 2. Enter expected precipitation depth (in) in blue cell.

Step 3. Read trigger volumes (**bold**) in green cells.

Expected Precipitation Depth = 0.11
 Aliquots per Sample = 17

Site	Area (ac)	Using RC calculated from flow data		
		RC	Expected Vol (ft ³)	Trigger Vol (ft ³)
Lucky	105	0.157	6582.5	387
Whitewater	498	0.069	13621.3	801
Main	79	0.246	7760.0	456
Main Alt	60	0.200	4791.6	282
Americana	875	0.144	50311.8	2960
AS_6	204	0.046	3747.0	220
State	34	0.160	2172.2	128

Notes:

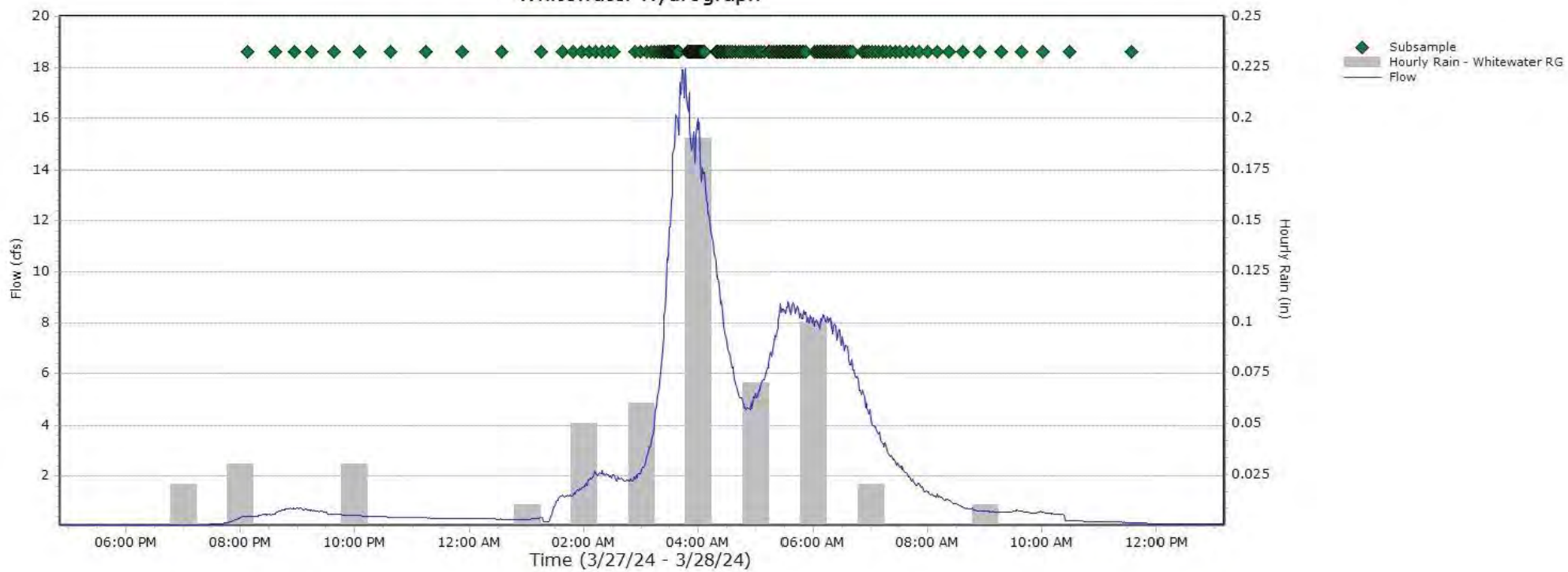
Calculated RC = Average (precip (ft) / [volume (ft³) x area (ft²)])

Where precip (ft) is the measured amount from local rain guage, and volume (ft³) is the measured discharge, and area (ft²) is the watershed area

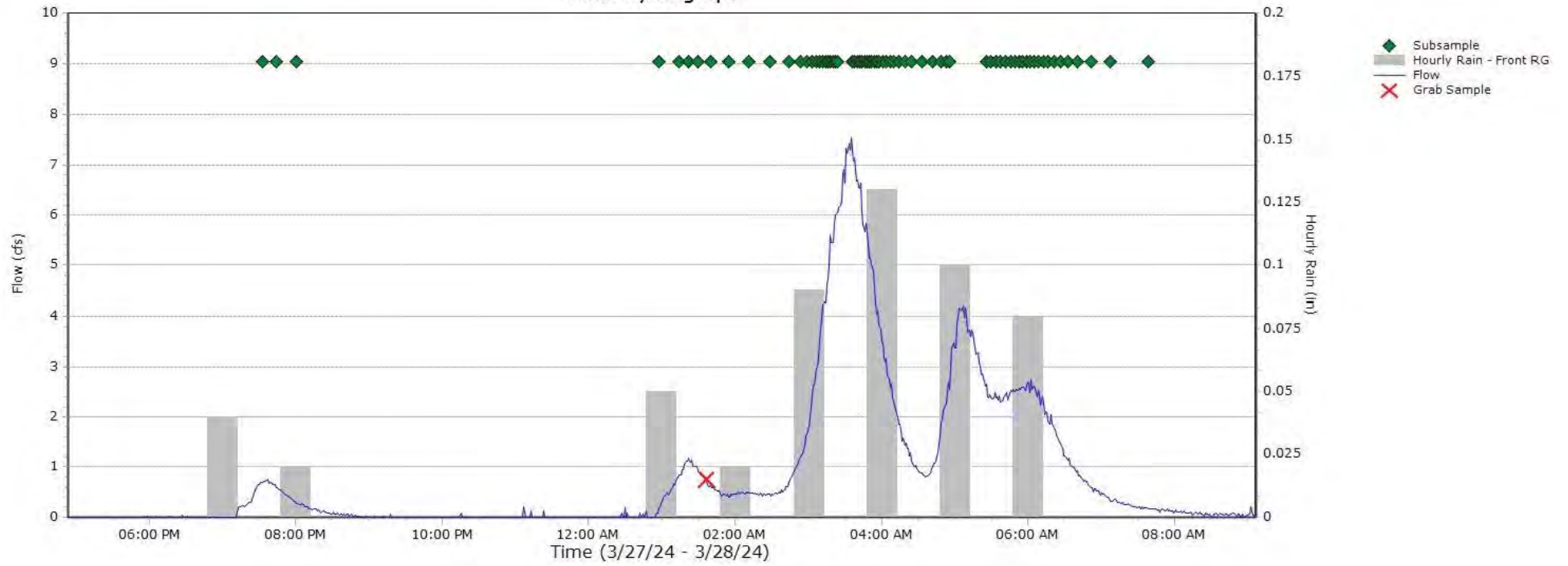
Expected volume (ft³) = RC x expected precip (ft) x area (ft²)

Attachment B: Storm Event Hydrographs

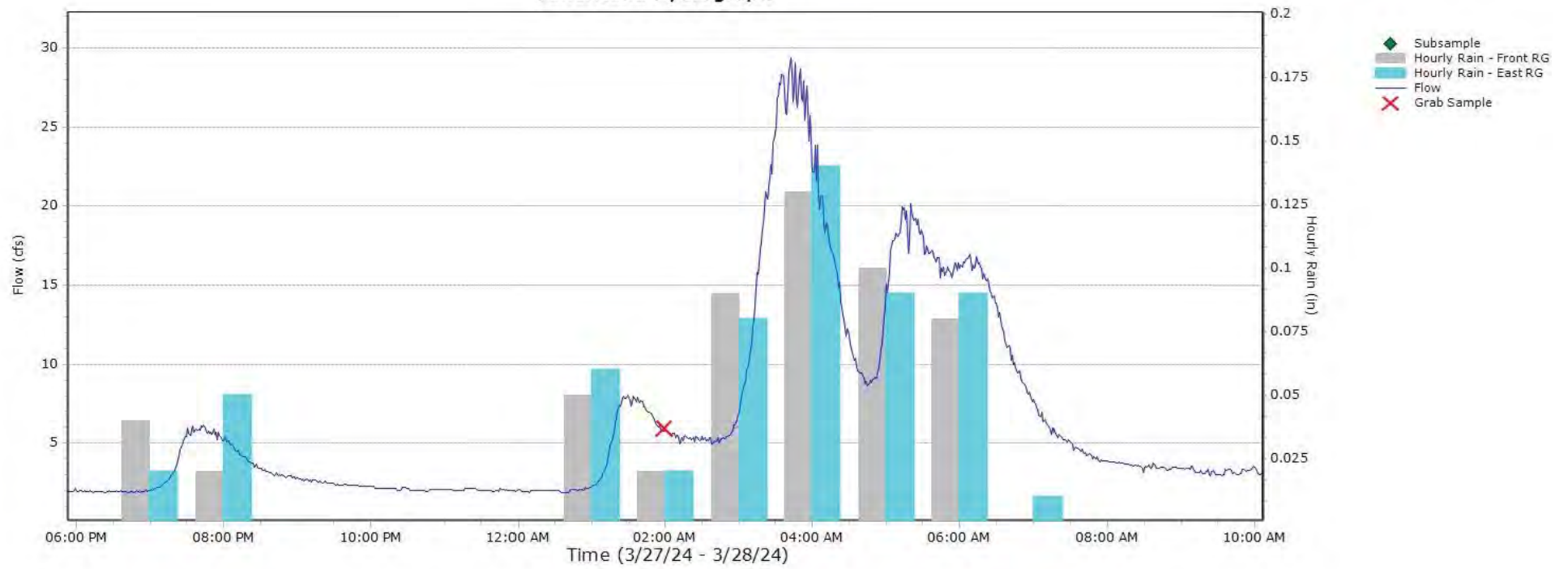
Whitewater Hydrograph



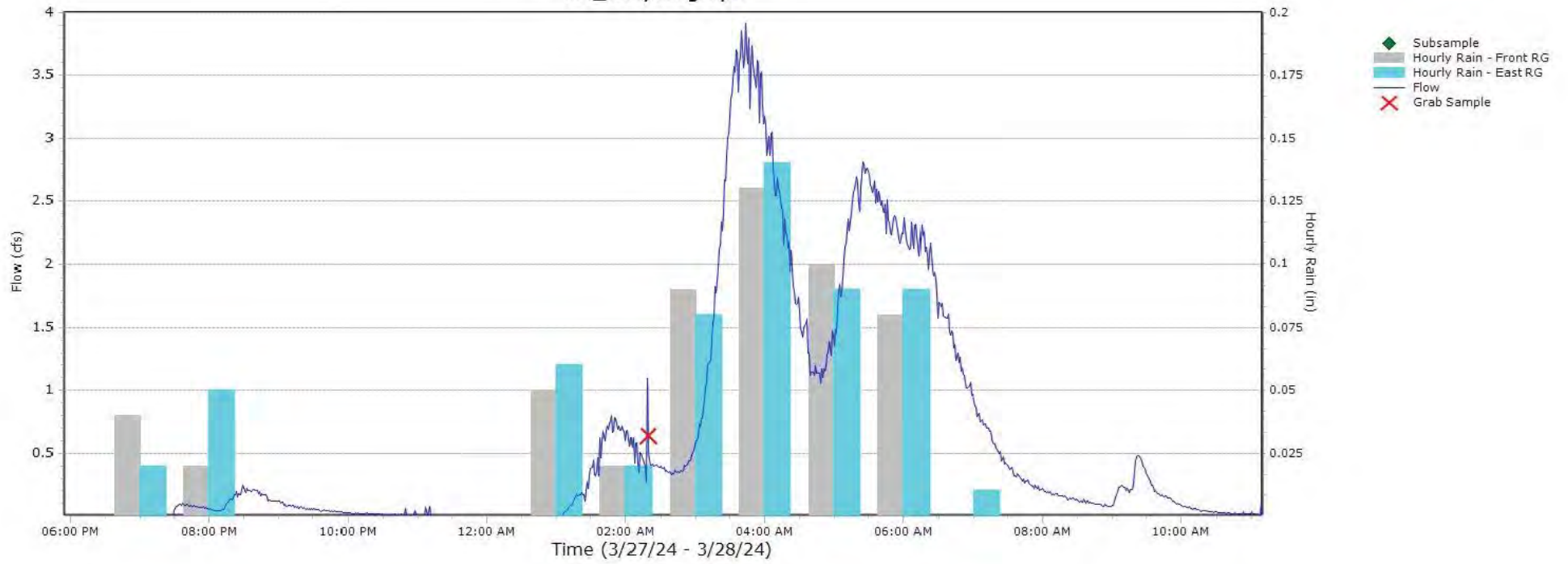
Main Hydrograph



Americana Hydrograph



AS_6 Hydrograph



Attachment C: Field Forms

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

TATION: Whitewater

SET UP

Personnel: KC, ST

Date/Time

On-Site: 3/27/24 1315

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1315	2.21	0.07	0.25	—
Enable Condition:		3.3		
Hysteresis:		1		
Flow Pulse Interval:		800cf		

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Set sampler program parameters
- ☒ Check date/time on sampler
- ☒ Verify all cable and tubing connections
- ☒ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time 3/27/24 1327
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: On Trigger, and set Sampler Enable equation
- ☒ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: ST

Date/Time

On-Site: 3/29/24 1209

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
12:09	2.13	0.09	0.33	—
Downloaded to:		Stevens USB		

On-Site

- ☒ ~~Replace flowmeter battery~~
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 3/29 1210
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

STATION: Whitewater
 Personnel: ST, KC

Composite Sample Collection

Bottle 1 of 8
 Date/Time On-Site: 3/28 2:35

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240328-11-WC</u>
Approx Sample Volume (mL):	<u>9500 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Tan Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>3/27/24 2007</u>	<u>SUCCESS</u>	13	<u>0148</u>	<u>SUCCESS</u>
2	<u>2036</u>		14	<u>0157</u>	
3	<u>2056</u>		15	<u>0205</u>	
4	<u>2115</u>		16	<u>0212</u>	
5	<u>2138</u>		17	<u>0219</u>	
6	<u>2206</u>		18	<u>0225</u>	
7	<u>2238</u>		19	<u>0231</u>	
8	<u>2313</u>		20	<u>0238</u>	<u>Skipped</u>
9	<u>2352</u>		21		
10	<u>3/28/24 0033</u>		22		
11	<u>0115</u>		23		
12	<u>0137</u>		24		

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>2:45 3/28 3/28</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: KC, ST

Bottle 2 of 8
 Date/Time On-Site: 3/28/24 0345

☒ Halt sampler program
☐ Put lid on sample bottle; label sample bottle
Sample ID: <u>240328-11</u> -WC
Approx Sample Volume (mL): <u>1400 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>gray</u>
QA/QC Sample ID: <u> </u> -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>3/28/24 0253</u>	<u>Success</u>	13	<u>3/28/24 0329</u>	<u>Success</u>
2	<u>0259</u>		14	<u>0330</u>	
3	<u>0305</u>		15	<u>0332</u>	
4	<u>0310</u>		16	<u>0333</u>	
5	<u>0313</u>		17	<u>0333</u>	
6	<u>0317</u>		18	<u>0334</u>	
7	<u>0319</u>		19	<u>0335</u>	
8	<u>0321</u>		20	<u>0336</u>	
9	<u>0323</u>		21	<u>0337</u>	
10	<u>0325</u>		22	<u>0338</u>	
11	<u>0326</u>		23	<u>0339</u>	
12	<u>0328</u>		24	<u>0340</u>	

Comments:

Date/Time Off-Site: 3/28/24 0350

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>0347 3/28</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: VC: 88

Bottle 3 of 8
 Date/Time On-Site: 3/28/24 415

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>3 240328 - 11</u> -WC
Approx Sample Volume (mL): <u>11,000 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Gray</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>3/28/24 0347</u>	<u>Success</u>	13	<u>3/28/24 357</u>	<u>Success</u>
2	<u>0348</u>		14	<u>358</u>	
3	<u>0349</u>		15	<u>359</u>	
4	<u>350</u>		16	<u>400</u>	
5	<u>351</u>		17	<u>401</u>	
6	<u>352</u>		18	<u>402</u>	
7	<u>352</u>		19	<u>403</u>	
8	<u>353</u>		20	<u>404</u>	
9	<u>354</u>		21	<u>405</u>	<u>Power Failed</u>
10	<u>355</u>		22	<u>406</u>	
11	<u>356</u>		23	<u>406</u>	
12	<u>356</u>		24	<u>407</u>	

Comments:

Date/Time Off-Site: 3/28/24 0420

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>3/28/24 418</u> ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: LC 85

Bottle 4 of 8
 Date/Time On-Site: 3/28/24 434

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240528-11</u> -WC
Approx Sample Volume (mL): <u>13250 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Gray</u>
QA/QC Sample ID: <u>-103</u> (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>3/28/24 410</u>	<u>Success</u>	13	<u>439</u>	<u>Success</u>
2	<u>420</u>		14	<u>442</u>	
3	<u>421</u>		15	<u>445</u>	
4	<u>422</u>		16	<u>447</u>	
5	<u>424</u>		17	<u>450</u>	
6	<u>426-24</u>		18	<u>453</u>	
7	<u>428</u>		19	<u>456</u>	
8	<u>429</u>		20	<u>458</u>	
9	<u>431</u>		21	<u>501</u>	
10	<u>433</u>		22	<u>504</u>	
11	<u>435</u>		23	<u>506</u>	
12	<u>437</u>	<u>Skipped</u>	24	<u>509</u>	

Comments:

If sampling is complete:

- ☐ Power off sampler, if separate from flowmeter
- ☐ Keep flowmeter running
- ☐ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle; add ice
- ☒ Restart program from beginning
- Date/Time Restarted: 3/28 512
- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: 100 ft in water
 Personnel: ICC, ST

Bottle 5 of 8
 Date/Time On-Site: 3/28/24 0555

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240328-11</u> -WC
Approx Sample Volume (mL): <u>13250</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Gray</u>
QA/QC Sample ID: <u>-103</u> (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	3/28/24 513	Success	13	3/28/24 534	Success
2	515		14	535	
3	517		15	537	
4	519		16	538	
5	521		17	540	
6	522		18	541	
7	524		19	543	
8	526		20	545	
9	527		21	546	
10	529		22	548	
11	531		23	549	
12	532		24	551	

Comments:

If sampling is complete:

- ☐ Power off sampler, if separate from flowmeter
- ☐ Keep flowmeter running
- ☐ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle; add ice
- ☒ Restart program from beginning
- Date/Time Restarted: 3/28/24 602
- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: VC, ST

Bottle 6 of 8

Date/Time On-Site: 3/28/24

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240328-11</u> -WC
Approx Sample Volume (mL): <u>13250</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>gray</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	3/28/24 1001	Success	13	3/28/24 1021	Success
2	1002		14	1022	
3	1004		15	1024	
4	1006		16	1026	
5	1008		17	1027	
6	1009		18	1029	
7	1011		19	1031	
8	1012		20	1033	
9	1014		21	1035	
10	1016		22	1037	
11	1017		23	1039	
12	1019		24	1041	

Comments:

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>3/28/24 1049</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: White Sulphur
 Personnel: KC, ST

Bottle 7 of 8
 Date/Time On-Site: 3/28/24 1025

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240328-11</u> -WC
Approx Sample Volume (mL): <u>13250</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: <u>-103</u> (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	3/28/24 650	Success	13	3/28/24 737	Success
2	653		14	743	
3	656		15	751	
4	658		16	759	
5	701		17	810	
6	705		18	821	
7	708		19	836	
8	712		20	855	
9	716		21	916	
10	721		22	938	
11	725		23	1001	
12	731		24	1029	

Comments:

If sampling is complete:

- ☐ Power off sampler, if separate from flowmeter
- ☐ Keep flowmeter running
- ☐ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle; add ice
- ☒ Restart program from beginning

Date/Time Restarted: 3/28/24 1033

- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Whitewater
 Personnel: PC, ST

Bottle 8 of 8

Date/Time On-Site: _____

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240328-11</u> -WC
Approx Sample Volume (mL): <u>800 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Clear</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Tan</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>3/28/24 1133</u>	<u>Success</u>	13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

If sampling is complete: ☒ Power off sampler, if separate from flowmeter ☒ Keep flowmeter running ☒ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

TATION: Main

SET UP

Personnel: KC, ST

Date/Time
On-Site: 3/27/24 12:37

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1237	6.84	0.00	0.00	12.8
Enable Condition or Velocity Cutoff:			1.84	
Deadband:			1	
Trigger Volume:			341	

- ☒ Install batteries on flowmeter and sampler
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☒ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

Replaced deadband on flowmeter -

offsite 3/27/24 1300

SHUT DOWN

Personnel: ST

Date/Time
On-Site: 3/29/24 12:22

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
12:22	7.45	0.00	0.00	-	12.6
Downloaded to:		Stevens USB			

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Composite Sample Collection

STATION: Main
 Personnel: ST, KC

Bottle 1 of 3
 Date/Time On-Site: 3/28/24 1:30

☒ Halt sampler program		
☒ Put lid on sample bottle; label sample bottle		
Sample ID:	<u>240528-12</u>	-WC
Approx Sample Volume (mL):	<u>4000 mL</u>	
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>	
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>Gray</u>	
QA/QC Sample ID:		-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	3/27/24 19:53	Success	13	3/28/24 02:53	Success
2	19:48		14	02:59	
3	20:01		15	03:03	
4	3/28 00:58		16	03:06	
5	01:14		17	03:09	
6	01:22		18	03:12	
7	01:30		19	03:14	
8	01:40		20	03:16	
9	01:55		21	03:18	
10	02:12		22	03:20	
11	02:29		23	03:22	
12	02:44		24	03:24	

Comments:

If sampling is complete:

- ☐ Power off sampler, if separate from flowmeter
- ☐ Keep flowmeter running
- ☐ Add ice to sample transport cooler

If continuing sampling (sample bottle change-out):

- ☒ Keep flowmeter running
- ☒ Install new 15L bottle, add ice
- ☒ Restart program from beginning

Date/Time Restarted: 3/28/24 03:35

- ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Composite Sample Collection

STATION: Main

Personnel: KLST

Date/Time On-Site: 3/28/24 0426

Bottle 2 of 3

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	<u>240328-12</u> -WC
Approx Sample Volume (mL):	<u>14000 mL</u>
Clarity (ex. Clear, Cloudy, Silty):	<u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black):	<u>gray</u>
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	<u>3/28/24 0336</u>	<u>Success</u>	13	<u>401</u>	<u>Success</u>
2	<u>338</u>		14	<u>404</u>	
3	<u>340</u>		15	<u>407</u>	
4	<u>342</u>		16	<u>410</u>	
5	<u>344</u>		17	<u>414</u>	
6	<u>346</u>		18	<u>419</u>	
7	<u>348</u>		19	<u>425</u>	
8	<u>350</u>		20	<u>433</u>	
9	<u>352</u>		21	<u>442</u>	
10	<u>354</u>		22	<u>449</u>	
11	<u>356</u>		23	<u>453</u>	
12	<u>358</u>		24	<u>456</u>	

Comments:

Date/Time Off-Site: 3/28 17:26

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning Date/Time Restarted: <u>3/28 523</u> ☒ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

STATION: Main Composite Sample Collection Bottle 5 of 3
 Personnel: ST, KC Date/Time On-Site: 3/28/24 750

☒ Halt sampler program
☒ Put lid on sample bottle; label sample bottle
Sample ID: <u>240328-12</u> -WC
Approx Sample Volume (mL): <u>12500 mL</u>
Clarity (ex. Clear, Cloudy, Silty): <u>Cloudy</u>
Color (ex. Clear, Gray, Tan, Brown, Black): <u>Gray</u>
QA/QC Sample ID: _____ -103 (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1	3/28/24 526	Success 609 ⁴	13	3/28/24 609	Success
2	530		14	613	
3	534		15	617	
4	538		16	622	
5	542		17	627	
6	546		18	633	
7	550		19	641	
8	553		20	652	
9	556		21	708	
10	559		22	739	
11	602		23		
12	605		24		

Comments:

Date/Time Off-Site: 3/28/24 755

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☒ Keep flowmeter running ☒ Install new 15L bottle; add ice ☒ Restart program from beginning - Date/Time Restarted: <u>3/28/24 755</u> ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Mein

Personnel: KC, ST Date/Time On-Site: 3/28/24 1.31

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
1.31	6.16	394.17 GPM	1.21	12.9	—	—

Grab Information					
	Sample ID		Date	Time	Labeled?
Site <i>E.Coli</i>	240328-12	-WG	3/28/24	0137	☒
Field Duplicate <i>E.Coli</i>	240328-12	-101	3/28/24	0138	☒
Field Blank <i>E.Coli</i>	240328-12	-001	3/28/24	0141	☒

*Note: time on bottle for QC samples is 1200 -

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP09	0141	10.91	10.02	7.82	116.08

Sampler Current Status	
First Subsample Date/Time	3/27/24 1933
Last Subsample Date/Time	3/28/24 0130
# of Subsamples taken	7

Comments:

Set Up/ Shut Down Form – ISCO (Whitewater, Americana, State)

STATION: Americana

SET UP

Personnel: ST, KC

Date/Time: 3/27/24 3:10 PM ST

On-Site: 16:10
15

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
16:12	5.99	1.99	2.200	12.29
Enable Condition:				
Hysteresis:				
Flow Pulse Interval:				

On-Site

- ☒ Replace flowmeter battery, install sampler battery
- ☒ Perform decon. cycle
- ☒ Install 15L sample bottle, with ice
- ☒ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☐ Set sampler program parameters
- ☐ Check date/time on sampler
- ☐ Verify all cable and tubing connections
- ☐ Verify sampler program is running

Flowlink (Refer to PG 411 or PG 412, if needed)

- ☒ Direct or Remote; Date/time 16:14 3/27/24
- ☒ Retrieve data and review recent flow history
- ☒ Change Wireless Power Control to Storm Event
- ☒ Change Data Storage Rates to 1 minute for Level, Velocity, Total Flow, and Flow Rate
- ☐ ~~Enable Sampler: On Trigger, and set Sampler Enable equation~~
- ☐ ~~Set Sampler Pacing to Flow Paced, and set trigger volume~~

Comments: Installed & Blank composite. Set up flowmeter only. No composite needed.

offsite: 3/27/24 15:23

SHUT DOWN

Personnel: ST

Date/Time: 3/29/24 12:35

On-Site: 12:35

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
12:36	6.52	2.35	2.299	12.07
Downloaded to: <u>Stevens USB</u>				

On-Site

- ☒ Replace flowmeter battery
- ☒ Remove battery from sampler

Flowlink (Refer to Flowlink Instructions, if needed)

- ☒ Direct or Remote; Date/time 3/29 12:36
- ☒ Retrieve data
- ☒ Change Wireless Power Control to Dry Weather
- ☒ Change Data Storage Rates to 15 minutes for Level, Velocity, Total Flow, and Flow Rate
- ☒ Enable Sampler: Never

Comments:

Composite Sample Collection

STATION: Americana Bottle 1 of 1

Personnel: _____ Date/Time On-Site: _____

☐ Halt sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	240328-14-002-103- ~~blank~~ (Time: 1200)

Subsample Information					
Trigger #	Date/Time	Error Message/ Subsample Result	Trigger #	Date/Time	Error Message/ Subsample Result
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments: QC Blank filed at 3/27/24 1510-1514. Removed at 10:08

If sampling is complete: ☐ Power off sampler, if separate from flowmeter ☐ Keep flowmeter running ☐ Add ice to sample transport cooler	If continuing sampling (sample bottle change-out): ☐ Keep flowmeter running ☐ Install new 15L bottle; add ice ☐ Restart program from beginning Date/Time Restarted: _____ ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart									
Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5"	400 mL	3.0"	3500 mL	5.5"	7250 mL	8.0"	11000 mL	10.5"	14750 mL
1.0"	800 mL	3.5"	4250 mL	6.0"	8000 mL	8.5"	11750 mL	11.0"	15500 mL
1.5"	1400 mL	4.0"	5000 mL	6.5"	8750 mL	9.0"	12500 mL	11.5"	16250 mL
2.0"	2000 mL	4.5"	5750 mL	7.0"	9500 mL	9.5"	13250 mL	After 12"	1" = 1500 mL
2.5"	2750 mL	5.0"	6500 mL	7.5"	10250 mL	10.0"	14000 mL	Lab min	8,000 mL

Grab Sample Data Form

STATION: Americana

Personnel: KCST Date/Time On-Site: 3/28/14 0153

Flow Meter Current Status						
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)
0156	9.94	6.33	3.368	12.16	—	—

Grab Information					
	Sample ID		Date	Time	Labeled?
Site E.Coli	240328-14	-WG	3/28/24	0159	☒
Field Duplicate E.Coli		-101			☐
Field Blank E.Coli		-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP08 ^{ve} 9	0102	9.79	10.57	7.28	255.40

Sampler Current Status	
First Subsample Date/Time	—
Last Subsample Date/Time	—
# of Subsamples taken	—

Comments: Not collecting composite sample for this set.

Set Up/ Shut Down Form – HACH (Lucky, Main, AS_6)

STATION: AS-6

SET UP

Personnel: KC, ST

Date/Time
On-Site: 3/27/24 1444

Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)
1449	0.00	0.00	0.00	12.4
Enable Condition or Velocity Cutoff:				—
Deadband:				—
Trigger Volume:				—

- ☒ Install batteries on flowmeter and sampler
- ☐ Perform decon. cycle
- ☐ Install 15L sample bottle, with ice
- ☐ Leave bottle lid at site, in a clean re-sealable plastic bag
- ☐ Verify all cable and tubing connections
- ☒ Check date and time on flowmeter and sampler
- ☒ Set flowmeter program and sampler program parameters
- ☒ Set logging interval to 1 minute
- ☒ Start flowmeter program and sampler program
- ☒ Verify running

Comments:

Set up flowmeter only. No composite for this site.

offsite: 1451

SHUT DOWN

Personnel: ST

Date/Time
On-Site: 3/29/24 13:29

Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
13:29	0.000	0.000	0.000	39.608	12.4
Downloaded to:				<u>Rugged</u>	

If flow monitoring is complete:

- ☒ Halt program on flowmeter
- ☒ Download flowmeter data
- ☒ Remove flowmeter battery

If continuing to monitor flow:

- ☐ Replace flowmeter battery
- ☐ Reset logging interval to 15 minutes
- ☐ Change velocity cutoff to 0.02 fps
- ☐ Start program
- ☐ Verify running

Comments:

Grab Sample Data Form

STATION: AS-6

Personnel: KC, ST Date/Time On-Site: 3/28/24 0210

Flow Meter Current Status					
Time	Level (in)	Flow (cfs)	Velocity (fps)	Battery (V)	Rainfall (in) (Whitewater Only)
0214	6.710	0.46	0.69	12.3	—

Grab Information				
	Sample ID	Date	Time	Labeled?
Site <i>E.Coli</i>	240328-206-WG	3/28/24	2:19	☒
Field Duplicate <i>E.Coli</i>	-101			☐
Field Blank <i>E.Coli</i>	-001			☐

*Note: time on bottle for QC samples is 1200

Field Parameters					
Meter number	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	SpCond (uS/cm)
MP009	2:25	7.74	9.92	7.60	108.59

Sampler Current Status	
First Subsample Date/Time	—
Last Subsample Date/Time	—
# of Subsamples taken	—

Comments: No composite taken at this site.

Date/Time Off-Site: 3/28/24 2:26

Attachment D: Storm Event Analytical Reports

Report Date: 05/02/2024 14:28



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00338-01	ACST1B	240328-12-WG	Water		03/28/2024	03/28/2024
AC00338-02	ACST1B	240328-12-101	Water		03/28/2024	03/28/2024
AC00338-03	ACST1B	240328-12-001	Water		03/28/2024	03/28/2024
AC00338-04	ACST1B	240328-14-WG	Water		03/28/2024	03/28/2024

Report Date: 05/02/2024 14:28



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B

Date/Time Collected: 03/28/2024 01:37

Lab Number: AC00338-01

Sample Type: Grab

Location Description: 240328-12-WG

Sample Collector: S.T

Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst	
				MDL *	MDL	Reference			Initials	Qualifier
Microbiology										
E. Coli	B241140	21.6MPN/100 mL		1.0	1.0	IDEXX - Colilert	03/28/24 08:46	3/29/24 10:00	KMR	
Net Chemistry										
Chlorine Screen	B241146	Absent				SM 4500-CL G-2000 mod	03/28/24	3/28/24 8:26	ALM	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML

Report Date: 05/02/2024 14:28



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 03/28/2024 12:00
Lab Number: AC00338-02
Sample Type: Grab

Location Description: 240328-12-101
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method	Prepared	Analyzed	Analyst	
				MDL *	MDL				Reference	Initials
Microbiology										
E. Coli	B241140	17.3MPN/100 mL		1.0	1.0	IDEXX - Colilert	03/28/24 08:46	3/29/24 10:00	KMR	
Wet Chemistry										
Chlorine Screen	B241146	Absent				SM 4500-CL G-2000 mod	03/28/24	3/28/24 8:26	ALM	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML

Report Date: 05/02/2024 14:28



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location:	ACST1B	Location Description:	240328-12-001
Date/Time Collected:	03/28/2024 12:00		
Lab Number:	AC00338-03	Sample Collector:	S.T
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted Method		Analysis Method Reference	Prepared	Analyzed	Analyst	
				MDL *	MDL				Initials	Qualifier
Microbiology										
E. Coli	B241140	<1.0MPN/100 mL		1.0	1.0	IDEXX - Colilert	03/28/24 08:46	3/29/24 10:00	KMR	U
Net Chemistry										
Chlorine Screen	B241146	Absent				SM 4500-CL G-2000 mod	03/28/24	3/28/24 8:26	ALM	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B, was corrected for dilution, dry weight, or method-defined ML.

Report Date: 05/02/2024 14:28



Boise City Public Works
Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Analysis Report

Location: ACST1B
Date/Time Collected: 03/28/2024 01:59
Lab Number: AC00338-04
Sample Type: Grab

Location Description: 240328-14-WG
Sample Collector: S.T
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Microbiology										
E. Coli	B241140	365.4 MPN/100 mL		1.0	1.0	IDEXX - Colilert	03/28/24 08:46	3/29/24 10:00	KMR	
Wet Chemistry										
Chlorine Screen	B241146	Absent				SM 4500-CL G-2000 mod	03/28/24	3/28/24 8:26	ALM	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

Report Date: 05/02/2024 14:28



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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B241140									
Blank (B241140-BLK1)									
E. Coli	Absent						03/29/2024	KMR	
LCS (B241140-BS1)									
E. Coli				Present			03/29/2024	KMR	
Duplicate (B241140-DUP1) Source ID: LS01907-10									
E. Coli					Pass	128	03/29/2024	KMR	

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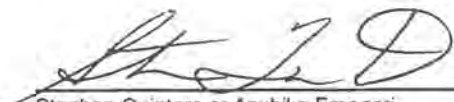
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Water Quality Laboratory
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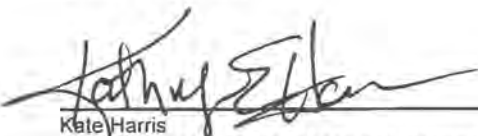
Notes and Definitions

Item	Definition
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Stephen Quintero or Azubike Emenari
QA/QC Coordinator


Kate Harris
Interim Water Quality Laboratory Manager

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418

Tel. (208) 387-6269

Fax (208) 387-6391

Purchase Order:

63065628

Project:

Stormwater-PI

Sampler(s):

Kristen Chislholm
Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	E. Coli - IDEXX Colilert	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
00338-01	3/28/24		0137		240328-12-WG	ST	X	X											X					1
-02	3/28/24		1200		240328-12-101	ST	X	X											X					1
-03	3/28/24		1200		240328-12-001	ST	X	X											X					1
-04	3/28/24		0159		240328-14-WG	ST	X	X											X					1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<i>Kristen Chislholm</i>	3/28/24 0814	<i>Steven Turner</i> 3/28/24 0816	

Report Date: 05/02/2024 14:28



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Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
Telephone (208) 608-7240
Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00339-01	ACST1B	240328-206-WG	Water		03/28/2024	03/28/2024

Report Date: 05/02/2024 14:28



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Analysis Report

Location:	ACST1B	Location Description:	240328-206-WG
Date/Time Collected:	03/28/2024 02:19		
Lab Number:	AC00339-01	Sample Collector:	S.T
Sample Type:	Grab	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Microbiology										
E. Coli	B241140	387.3 MPN/100 mL		1.0	1.0	IDEXX - Colilert	03/28/24 08:46	3/29/24 10:00	KMR	
Net Chemistry										
Chlorine Screen	B241146	Absent				SM 4500-CL G-2000 mod	03/28/24	3/28/24 8:26	ALM	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Microbiology									
Batch: B241140									
Blank (B241140-BLK1)									
E. Coli	Absent						03/29/2024	KMR	
LCS (B241140-BS1)									
E. Coli				Present			03/29/2024	KMR	
Duplicate (B241140-DUP1) Source ID: LS01907-10									
E. Coli					Pass	128	03/29/2024	KMR	



Notes and Definitions

Item	Definition
No notes entered.	

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Stephen Quintero or Azubike Emenari
QA/QC Coordinator

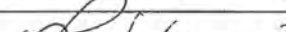

Kate Harris
Interim Water Quality Laboratory Manager

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order: 6
Project: S
Sampler(s): K

Stormwater-PI

Kristen Christelm
Steven Turner

[illegible]

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
	3/28/24 0814	 3/28/24 0814	

AC00339 Ar AD339

Report Date: 05/02/2024 14:36



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Water Quality Laboratory
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Boise, Idaho 83714-1076
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Fax (208) 608-7319

Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00341-01	ACST1C	240328-11-WC	Water		03/28/2024	03/28/2024

Report Date: 05/02/2024 14:36



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Analysis Report

Location:	ACST1C	Location Description:	240328-11-WC
Date/Time Collected:	03/27/2024 20:07 - 03/28/2024 11:33		
Lab Number:	AC00341-01	Sample Collector:	K.C
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted Method MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B241161	0.236	mg/L	0.0450	0.0450	Timberline Ammonia-001	03/29/24	3/29/24 11:19	ALN	
IOD5	B241168	8.20	mg/L	2.00	2.00	SM 5210 B-2016	03/29/24	4/3/24 9:59	ALM	
Chloride	B241409	14.9	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	04/18/24	4/18/24 15:37	SMC	
IOD	B241167	84.0	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	03/29/24	3/29/24 9:37	RKT	
Nitrate-Nitrite, as N	B241189	0.277	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	04/01/24	4/1/24 14:29	JAL	
TKN	B241263	1.63	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	04/04/24	4/5/24 12:53	EDM	
Total Dissolved Solids	B241163	76.0	mg/L	20.0	20.0	SM 2540 C-2015	03/28/24	3/30/24 15:18	BAK	
Total Suspended Solids	B241172	131	mg/L	0.900	0.900	SM 2540 D-2015	03/29/24	3/29/24 10:10	SMC	
Turbidity	B241159	26.2	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	03/28/24	3/28/24 14:35	LRF	
Dissolved Wet Chemistry										
Orthophosphate, as P	B241173	0.131	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/29/24	3/29/24 13:02	JAL	
Total Metals										
Mercury	B241233	0.0151	ug/L	0.0100	0.0100	EPA 245.1	04/04/24	4/5/24 7:58	SAS	
Arsenic	B241177	2.0	ug/L	0.070	0.070	EPA 200.8	04/13/24	4/14/24 17:54	DMW	
Cadmium	B241177	0.074	ug/L	0.010	0.010	EPA 200.8	04/13/24	4/14/24 17:54	DMW	
Calcium	B241226	7.94	mg/L	0.0400	0.0400	EPA 200.7	04/03/24	4/11/24 17:34	EDM	
Lead	B241177	5.8	ug/L	0.010	0.010	EPA 200.8	04/13/24	4/14/24 17:54	DMW	
Magnesium	B241226	2930	ug/L	80.0	80.0	EPA 200.7	04/03/24	4/11/24 17:34	EDM	
Phosphorus as P	B241226	0.318	mg/L	0.0120	0.0120	EPA 200.7	04/03/24	4/11/24 17:34	EDM	
Hardness	B241226	31.9	mg/L	0.100	0.100	SM 2340 B-2011	04/03/24	4/11/24 17:34	EDM	
Dissolved Metals										
Cadmium	B241178	<0.0100	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 16:00	DMW	U
Copper	B241178	1.9	ug/L	0.15	0.15	EPA 200.8	04/04/24	4/4/24 16:00	DMW	
Lead	B241178	0.097	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 16:00	DMW	
Zinc	B241178	9.8	ug/L	0.50	0.50	EPA 200.8	04/04/24	4/4/24 16:00	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B, was corrected for dilution, dry weight, or method-defined ML.

Report Date: 05/02/2024 14:36



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Water Quality Laboratory
11818 Joplin Road
Boise, Idaho 83714-1076
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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry									
Batch: B241159									
Blank (B241159-BLK1)									
Turbidity	<0.3	NTU					03/28/2024	LRF	U
LCS (B241159-BS1)									
Turbidity			102	90-110			03/28/2024	LRF	
Duplicate (B241159-DUP1) Source ID: AC00340-01									
Turbidity					0.809	25	03/28/2024	LRF	
Batch: B241161									
Blank (B241161-BLK1)									
Ammonia, as N	<0.045	mg/L					03/29/2024	ALN	U
Blank (B241161-BLK2)									
Ammonia, as N	<0.045	mg/L					03/29/2024	ALN	U
LCS (B241161-BS1)									
Ammonia, as N			99.1	87-104			03/29/2024	ALN	
Duplicate (B241161-DUP1) Source ID: WB03028-08									
Ammonia, as N					0.615	20	03/29/2024	ALN	D
Matrix Spike (B241161-MS1) Source ID: WB03028-08									
Ammonia, as N			101	84-115			03/29/2024	ALN	D
Matrix Spike (B241161-MS2) Source ID: EP00320-01									
Ammonia, as N			101	84-115			03/29/2024	ALN	
Matrix Spike (B241161-MS3) Source ID: AC00341-01									
Ammonia, as N			102	84-115			03/29/2024	ALN	
Matrix Spike Dup (B241161-MSD1) Source ID: WB03028-08									
Ammonia, as N			99.6	84-115	0.840	20	03/29/2024	ALN	D
Batch: B241163									
Blank (B241163-BLK1)									
Total Dissolved Solids	<20	mg/L					03/30/2024	BAK	U
LCS (B241163-BS1)									
Total Dissolved Solids			99.3	90-110			03/30/2024	BAK	
Duplicate (B241163-DUP1) Source ID: RW00064-08									
Total Dissolved Solids					7.62	10	03/30/2024	BAK	

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Quality Control Report
(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Net Chemistry (Continued)									
Batch: B241167									
Blank (B241167-BLK1)									
COD	<7	mg/L					03/29/2024	RKT	U
LCS (B241167-BS1)									
COD			98.3	90-110			03/29/2024	RKT	
Duplicate (B241167-DUP1)	Source ID: AC00341-01								
COD					3.64	10	03/29/2024	RKT	
Batch: B241168									
Blank (B241168-BLK1)									
BOD5	<2	mg/L					04/03/2024	ALM	U
LCS (B241168-BS1)									
BOD5			103	84.6-115.4			04/03/2024	ALM	
LCS (B241168-BS2)									
BOD5			106	84.6-115.4			04/03/2024	ALM	
Duplicate (B241168-DUP1)	Source ID: LS01908-02								
BOD5					3.16	30	04/03/2024	ALM	
Batch: B241172									
Blank (B241172-BLK1)									
Total Suspended Solids	<0.9	mg/L					03/29/2024	SMC	U
LCS (B241172-BS1)									
Total Suspended Solids			91.2	90-110			03/29/2024	SMC	
Duplicate (B241172-DUP1)	Source ID: LS01908-02								
Total Suspended Solids					0.951	20	03/29/2024	SMC	
Batch: B241189									
Blank (B241189-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					04/01/2024	JAL	U
LCS (B241189-BS1)									
Nitrate-Nitrite, as N			96.2	90-110			04/01/2024	JAL	
Duplicate (B241189-DUP1)	Source ID: AC00340-01								
Nitrate-Nitrite, as N					2.37	10	04/01/2024	JAL	
Matrix Spike (B241189-MS1)	Source ID: AC00340-01								
Nitrate-Nitrite, as N			97.6	90-110			04/01/2024	JAL	
Matrix Spike Dup (B241189-MSD1)	Source ID: AC00340-01								
Nitrate-Nitrite, as N			96.8	90-110	0.678	10	04/01/2024	JAL	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier		
Wet Chemistry (Continued)											
Batch: B241263											
Blank (B241263-BLK1) TKN	<0.1	mg/L					04/05/2024	EDM	U		
Blank (B241263-BLK2) TKN	<0.1	mg/L					04/05/2024	EDM	U		
LCS (B241263-BS1) TKN			98.7	80-120			04/05/2024	EDM			
LCS (B241263-BS2) TKN			95.9	80-120			04/05/2024	EDM			
Duplicate (B241263-DUP1) TKN	Source ID: AC00341-01				4.82	20	04/05/2024	EDM			
Duplicate (B241263-DUP2) TKN	Source ID: RW00065-02				0.416	20	04/05/2024	EDM	D		
Duplicate (B241263-DUP3) TKN	Source ID: RW00065-07				3.97	20	04/05/2024	EDM	D		
Matrix Spike (B241263-MS1) TKN	Source ID: AC00341-01				102	80-120	04/05/2024	EDM			
Matrix Spike (B241263-MS2) TKN	Source ID: RW00065-02				101	80-120	04/05/2024	EDM	D		
Matrix Spike (B241263-MS3) TKN	Source ID: RW00065-07				88.7	80-120	04/05/2024	EDM	D		
Matrix Spike Dup (B241263-MSD1) TKN	Source ID: AC00341-01				97.7	80-120	3.03	20	04/05/2024	EDM	
Matrix Spike Dup (B241263-MSD2) TKN	Source ID: RW00065-02				98.7	80-120	1.20	20	04/05/2024	EDM	D
Matrix Spike Dup (B241263-MSD3) TKN	Source ID: RW00065-07				95.8	80-120	3.01	20	04/05/2024	EDM	D
Batch: B241409											
Blank (B241409-BLK1) Chloride	<0.015	mg/L					04/18/2024	SMC	U		
Blank (B241409-BLK2) Chloride	<0.015	mg/L					04/19/2024	SMC	U		
Blank (B241409-BLK3) Chloride	<0.015	mg/L					04/19/2024	SMC	U		
LCS (B241409-BS1) Chloride			96.8	90-110			04/18/2024	SMC			
LCS (B241409-BS2) Chloride			96.2	90-110			04/18/2024	SMC			
LCS (B241409-BS3) Chloride			96.3	90-110			04/19/2024	SMC			



Quality Control Report
Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Vet Chemistry (Continued)									
Batch: B241409 (Continued)									
Duplicate (B241409-DUP1) Chloride	Source ID: AC00340-01				0.0752	10	04/18/2024	SMC	
Duplicate (B241409-DUP2) Chloride	Source ID: RW00065-13				0.328	10	04/18/2024	SMC	D
Duplicate (B241409-DUP4) Chloride	Source ID: RW00069-11				0.239	10	04/19/2024	SMC	
Duplicate (B241409-DUP5) Chloride	Source ID: RW00070-08				0.923	10	04/19/2024	SMC	D
Duplicate (B241409-DUP6) Chloride	Source ID: RW00067-10RE1				0.341	10	04/20/2024	SMC	D
Matrix Spike (B241409-MS1) Chloride	Source ID: AC00340-01		97.9	90-110			04/18/2024	SMC	
Matrix Spike (B241409-MS2) Chloride	Source ID: RW00065-13		96.8	90-110			04/18/2024	SMC	D
Matrix Spike (B241409-MS4) Chloride	Source ID: RW00069-11		98.8	90-110			04/19/2024	SMC	
Matrix Spike (B241409-MS5) Chloride	Source ID: RW00070-08		98.2	90-110			04/19/2024	SMC	D
Matrix Spike (B241409-MS6) Chloride	Source ID: RW00067-10RE1		95.5	90-110			04/20/2024	SMC	D
Matrix Spike Dup (B241409-MSD1) Chloride	Source ID: AC00340-01		97.9	90-110	0.0119	10	04/18/2024	SMC	
Matrix Spike Dup (B241409-MSD2) Chloride	Source ID: RW00065-13		97.0	90-110	0.105	10	04/19/2024	SMC	D
Matrix Spike Dup (B241409-MSD4) Chloride	Source ID: RW00069-11		99.6	90-110	0.708	10	04/19/2024	SMC	
Matrix Spike Dup (B241409-MSD5) Chloride	Source ID: RW00070-08		98.8	90-110	0.380	10	04/19/2024	SMC	D
Matrix Spike Dup (B241409-MSD6) Chloride	Source ID: RW00067-10RE1		96.6	90-110	0.595	10	04/20/2024	SMC	D

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Telephone (208) 608-7240
Fax (208) 608-7319

Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier		
Dissolved Wet Chemistry											
Batch: B241173											
Blank (B241173-BLK1) Orthophosphate, as P	<0.003	mg/L					03/29/2024	JAL	U		
Blank (B241173-BLK2) Orthophosphate, as P	<0.003	mg/L					03/29/2024	JAL	U		
LCS (B241173-BS1) Orthophosphate, as P			97.4	90-110			03/29/2024	JAL			
LCS (B241173-BS2) Orthophosphate, as P			98.8	90-110			03/29/2024	JAL			
Duplicate (B241173-DUP1) Orthophosphate, as P	Source ID: AC00340-01				0.151	10	03/29/2024	JAL			
Duplicate (B241173-DUP2) Orthophosphate, as P	Source ID: RW00064-08				0.870	10	03/29/2024	JAL	D		
Duplicate (B241173-DUP3) Orthophosphate, as P	Source ID: WB03032-06				0.481	10	03/29/2024	JAL	D		
Matrix Spike (B241173-MS1) Orthophosphate, as P	Source ID: AC00340-01				99.1	90-110	03/29/2024	JAL			
Matrix Spike (B241173-MS2) Orthophosphate, as P	Source ID: RW00064-08				99.9	90-110	03/29/2024	JAL	D		
Matrix Spike (B241173-MS3) Orthophosphate, as P	Source ID: WB03032-06				99.8	90-110	03/29/2024	JAL	D		
Matrix Spike Dup (B241173-MSD1) Orthophosphate, as P	Source ID: AC00340-01				98.4	90-110	0.459	10	03/29/2024	JAL	
Matrix Spike Dup (B241173-MSD2) Orthophosphate, as P	Source ID: RW00064-08				101	90-110	0.438	10	03/29/2024	JAL	D
Matrix Spike Dup (B241173-MSD3) Orthophosphate, as P	Source ID: WB03032-06				101	90-110	0.301	10	03/29/2024	JAL	D

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Quality Control Report
Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B241177									
Blank (B241177-BLK1)									
Arsenic	<0.070	ug/L					04/14/2024	DMW	U
Cadmium	<0.010	ug/L					04/14/2024	DMW	U
Lead	<0.010	ug/L					04/14/2024	DMW	U
LCS (B241177-BS1)									
Arsenic			101	85-115			04/14/2024	DMW	
Cadmium			102	85-115			04/14/2024	DMW	
Lead			103	85-115			04/14/2024	DMW	
Duplicate (B241177-DUP1) Source ID: ES00308-04									
Arsenic					1.20	20	04/14/2024	DMW	
Cadmium					NR	20	04/14/2024	DMW	U
Lead					0.466	20	04/14/2024	DMW	
Matrix Spike (B241177-MS1) Source ID: ES00308-04									
Arsenic			100	70-130			04/14/2024	DMW	
Cadmium			101	70-130			04/14/2024	DMW	
Lead			101	70-130			04/14/2024	DMW	
Matrix Spike Dup (B241177-MSD1) Source ID: ES00308-04									
Arsenic			101	70-130	0.462	20	04/14/2024	DMW	
Cadmium			102	70-130	1.01	20	04/14/2024	DMW	
Lead			101	70-130	0.120	20	04/14/2024	DMW	
Batch: B241226									
Blank (B241226-BLK1)									
Calcium	<0.04	mg/L					04/11/2024	EDM	U
Magnesium	<80	ug/L					04/11/2024	EDM	U
Phosphorus as P	<0.012	mg/L					04/11/2024	EDM	U
LCS (B241226-BS1)									
Calcium			98.9	85-115			04/11/2024	EDM	
Magnesium			101	85-115			04/11/2024	EDM	
Phosphorus as P			102	85-115			04/11/2024	EDM	
Duplicate (B241226-DUP1) Source ID: AC00341-01									
Calcium					1.81	20	04/11/2024	EDM	
Magnesium					1.16	20	04/11/2024	EDM	
Phosphorus as P					2.27	20	04/11/2024	EDM	
Matrix Spike (B241226-MS1) Source ID: AC00341-01									
Calcium			100	70-130			04/11/2024	EDM	
Magnesium			102	70-130			04/11/2024	EDM	
Phosphorus as P			101	70-130			04/11/2024	EDM	
Matrix Spike Dup (B241226-MSD1) Source ID: AC00341-01									
Calcium			102	70-130	1.34	20	04/11/2024	EDM	
Magnesium			103	70-130	0.658	20	04/11/2024	EDM	
Phosphorus as P			103	70-130	1.62	20	04/11/2024	EDM	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B241233									
Blank (B241233-BLK1)									
Mercury	<0.01	ug/L					04/05/2024	SAS	U
LCS (B241233-BS1)									
Mercury			104	85-115			04/05/2024	SAS	
Duplicate (B241233-DUP1) Source ID: AC00340-01									
Mercury					47.0	20	04/05/2024	SAS	QC-02
Duplicate (B241233-DUP2) Source ID: BB03721-01									
Mercury					NR	20	04/05/2024	SAS	U
Matrix Spike (B241233-MS1) Source ID: AC00340-01									
Mercury			97.8	70-130			04/05/2024	SAS	
Matrix Spike (B241233-MS2) Source ID: BB03721-01									
Mercury			101	70-130			04/05/2024	SAS	
Matrix Spike (B241233-MS3) Source ID: EP00317-02RE1									
Mercury			75.9	70-130			04/05/2024	SAS	D
Matrix Spike Dup (B241233-MSD1) Source ID: AC00340-01									
Mercury			91.3	70-130	5.80	20	04/05/2024	SAS	
Matrix Spike Dup (B241233-MSD2) Source ID: BB03721-01									
Mercury			102	70-130	1.06	20	04/05/2024	SAS	



Quality Control Report
Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B241178									
Blank (B241178-BLK1)									
Cadmium	<0.010	ug/L					04/04/2024	DMW	U
Copper	<0.15	ug/L					04/04/2024	DMW	U
Lead	<0.0090	ug/L					04/04/2024	DMW	U
Zinc	<0.50	ug/L					04/04/2024	DMW	U
LCS (B241178-BS1)									
Cadmium			99.9	85-115			04/04/2024	DMW	
Copper			93.2	85-115			04/04/2024	DMW	
Lead			99.4	85-115			04/04/2024	DMW	
Zinc			94.5	85-115			04/04/2024	DMW	
Duplicate (B241178-DUP1) Source ID: AC00340-01									
Cadmium					NR	10	04/04/2024	DMW	U
Copper					0.527	10	04/04/2024	DMW	
Lead					2.01	10	04/04/2024	DMW	
Zinc					1.59	10	04/04/2024	DMW	
Matrix Spike (B241178-MS1) Source ID: AC00340-01									
Cadmium			102	70-130			04/04/2024	DMW	
Copper			91.6	70-130			04/04/2024	DMW	
Lead			98.4	70-130			04/04/2024	DMW	
Zinc			91.2	70-130			04/04/2024	DMW	
Matrix Spike Dup (B241178-MSD1) Source ID: AC00340-01									
Cadmium			102	70-130	0.490	10	04/04/2024	DMW	
Copper			91.9	70-130	0.188	10	04/04/2024	DMW	
Lead			98.3	70-130	0.146	10	04/04/2024	DMW	
Zinc			89.8	70-130	0.970	10	04/04/2024	DMW	

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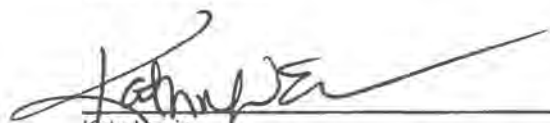
Notes and Definitions

Item	Definition
D	Data reported from a dilution
QC-02	The RPD is greater than the method acceptance criteria. At least one of the values used to calculate the RPD, is less than or equal to the PQL.
U	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Stephen Quintero or Azubike Emenari
QA/QC Coordinator


Kate Harris
Interim Water Quality Laboratory Manager

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628

Stormwater-PI

Kristen Chusholm
Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Matrix	Type	Composite	BOD ₅ - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	~~E. Coli~~ - IDEXX Confirm Chlorides EPA 300.0	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Containers
AC00341-01	3/27/24	3/28/24	2007	1133	240328-11-WC	KC	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	8

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
<u>Kristen Chusholm</u>	3/28/24 1314	<u>[Signature]</u> 3/28/24 1314	

AC00341

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Samples in this Report

Lab ID	Sample	Sample Description	Matrix	Qualifiers	Date Sampled	Date Received
AC00340-01	ACST1C	240328-12-WC	Water		03/28/2024	03/28/2024
AC00340-02	ACST1C	240328-14-002	Water		03/28/2024	03/28/2024

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Analysis Report

Location:	ACST1C	Location Description:	240328-12-WC
Date/Time Collected:	03/27/2024 19:33 - 03/28/2024 07:39		
Lab Number:	AC00340-01	Sample Collector:	K.C
Sample Type:	Composite	Sample Matrix:	Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Net Chemistry										
Ammonia, as N	B241161	0.293	mg/L	0.0450	0.0450	Timberline Ammonia-001	03/29/24	3/29/24 11:29	ALN	
BOD5	B241168	5.03	mg/L	2.00	2.00	SM 5210 B-2016	03/29/24	4/3/24 10:05	ALM	
Chloride	B241409	5.19	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	04/18/24	4/18/24 13:51	SMC	
COD	B241167	104	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	03/29/24	3/29/24 9:37	RKT	
Nitrate-Nitrite, as N	B241189	0.151	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	04/01/24	4/1/24 14:23	JAL	
TKN	B241263	1.18	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	04/04/24	4/5/24 12:51	EDM	
Total Dissolved Solids	B241163	44.2	mg/L	20.0	20.0	SM 2540 C-2015	03/28/24	3/30/24 15:17	BAK	
Total Suspended Solids	B241172	91.7	mg/L	0.900	0.900	SM 2540 D-2015	03/29/24	3/29/24 10:11	SMC	
Turbidity	B241159	24.6	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	03/28/24	3/28/24 14:17	LRF	
Dissolved Wet Chemistry										
Orthophosphate, as P	B241173	0.0494	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/29/24	3/29/24 12:56	JAL	
Total Metals										
Mercury	B241233	0.0171	ug/L	0.0100	0.0100	EPA 245.1	04/04/24	4/5/24 7:41	SAS	
Arsenic	B241177	1.1	ug/L	0.070	0.070	EPA 200.8	04/13/24	4/14/24 17:49	DMW	
Cadmium	B241177	0.071	ug/L	0.010	0.010	EPA 200.8	04/13/24	4/14/24 17:49	DMW	
Calcium	B241226	2.99	mg/L	0.0400	0.0400	EPA 200.7	04/03/24	4/11/24 17:24	EDM	
Lead	B241177	5.9	ug/L	0.010	0.010	EPA 200.8	04/13/24	4/14/24 17:49	DMW	
Magnesium	B241226	1260	ug/L	80.0	80.0	EPA 200.7	04/03/24	4/11/24 17:24	EDM	
Phosphorus as P	B241226	0.145	mg/L	0.0120	0.0120	EPA 200.7	04/03/24	4/11/24 17:24	EDM	
Hardness	B241226	12.6	mg/L	0.100	0.100	SM 2340 B-2011	04/03/24	4/11/24 17:24	EDM	
Dissolved Metals										
Cadmium	B241178	<0.0100	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 15:50	DMW	U
Copper	B241178	2.3	ug/L	0.15	0.15	EPA 200.8	04/04/24	4/4/24 15:50	DMW	
Lead	B241178	0.068	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 15:50	DMW	
Zinc	B241178	14.7	ug/L	0.50	0.50	EPA 200.8	04/04/24	4/4/24 15:50	DMW	

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.

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Analysis Report

Location: ACST1C
Date/Time Collected: 03/28/2024 12:00
Lab Number: AC00340-02
Sample Type: Composite

Location Description: 240328-14-002
Sample Collector: K.C
Sample Matrix: Water

Analyte Name	Batch	Result	Units	Adjusted MDL *	Method MDL	Analysis Method Reference	Prepared	Analyzed	Analyst Initials	Qualifier
Wet Chemistry										
Ammonia, as N	B241161	<0.0450	mg/L	0.0450	0.0450	Timberline Ammonia-001	03/29/24	3/29/24 11:26	ALN	U
BOD5	B241168	<2.00	mg/L	2.00	2.00	SM 5210 B-2016	03/29/24	4/3/24 10:05	ALM	U
Chloride	B241409	<0.0150	mg/L	0.0150	0.0150	EPA 300.0, Rev. 2.1 (1993)	04/18/24	4/18/24 17:23	SMC	U
COD	B241167	<7.00	mg/L	7.00	7.00	HH 8000, Standard Method 5220 D	03/29/24	3/29/24 9:37	RKT	U
Nitrate-Nitrite, as N	B241189	<0.0250	mg/L	0.0250	0.0250	EPA 353.2, Rev. 2.0 (1993)	04/01/24	4/1/24 14:28	JAL	U
TKN	B241263	<0.100	mg/L	0.100	0.100	EPA 351.2, 10-107-06-2-M (Equivalent)	04/04/24	4/5/24 12:52	EDM	U
Total Dissolved Solids	B241163	<20.0	mg/L	20.0	20.0	SM 2540 C-2015	03/28/24	3/30/24 15:18	BAK	U
Total Suspended Solids	B241172	<0.900	mg/L	0.900	0.900	SM 2540 D-2015	03/29/24	3/29/24 9:42	SMC	U
Turbidity	B241159	<0.3	NTU	0.3	0.3	EPA 180.1, Rev. 2.0 (1993)	03/28/24	3/28/24 14:43	LRF	U
Dissolved Wet Chemistry										
Orthophosphate, as P	B241173	<3.00E-3	mg/L	3.00E-3	3.00E-3	EPA 365.1, Rev. 2.0 (1993)	03/29/24	3/29/24 13:01	JAL	U
Total Metals										
Mercury	B241233	<0.0100	ug/L	0.0100	0.0100	EPA 245.1	04/04/24	4/5/24 7:54	SAS	U
Arsenic	B241177	<0.0700	ug/L	0.070	0.070	EPA 200.8	04/13/24	4/14/24 17:51	DMW	U
Cadmium	B241177	<0.0100	ug/L	0.010	0.010	EPA 200.8	04/13/24	4/14/24 17:51	DMW	U
Calcium	B241226	<0.0400	mg/L	0.0400	0.0400	EPA 200.7	04/03/24	4/11/24 17:31	EDM	U
Lead	B241177	<0.0100	ug/L	0.010	0.010	EPA 200.8	04/13/24	4/14/24 17:51	DMW	U
Magnesium	B241226	<80.0	ug/L	80.0	80.0	EPA 200.7	04/03/24	4/11/24 17:31	EDM	U
Phosphorus as P	B241226	<0.0120	mg/L	0.0120	0.0120	EPA 200.7	04/03/24	4/11/24 17:31	EDM	U
Hardness	B241226	<0.100	mg/L	0.100	0.100	SM 2340 B-2011	04/03/24	4/11/24 17:31	EDM	U
Dissolved Metals										
Cadmium	B241178	<0.0100	ug/L	0.010	0.010	EPA 200.8	04/04/24	4/4/24 15:47	DMW	U
Copper	B241178	<0.150	ug/L	0.15	0.15	EPA 200.8	04/04/24	4/4/24 15:47	DMW	U
Lead	B241178	<9.00E-3	ug/L	9.00E-3	9.00E-3	EPA 200.8	04/04/24	4/4/24 15:47	DMW	U
Zinc	B241178	<0.500	ug/L	0.50	0.50	EPA 200.8	04/04/24	4/4/24 15:47	DMW	U

* The reported adjusted "MDL" is sample-specific. The analysis MDL as defined by 40 CFR pt 136 App.B. was corrected for dilution, dry weight, or method-defined ML.



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Quality Control Report

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Vet Chemistry									
Batch: B241159									
Blank (B241159-BLK1)									
Turbidity	<0.3	NTU					03/28/2024	LRF	U
LCS (B241159-BS1)									
Turbidity			102	90-110			03/28/2024	LRF	
Duplicate (B241159-DUP1) Source ID: AC00340-01									
Turbidity					0.809	25	03/28/2024	LRF	
Batch: B241161									
Blank (B241161-BLK1)									
Ammonia, as N	<0.045	mg/L					03/29/2024	ALN	U
Blank (B241161-BLK2)									
Ammonia, as N	<0.045	mg/L					03/29/2024	ALN	U
LCS (B241161-BS1)									
Ammonia, as N			99.1	87-104			03/29/2024	ALN	
Duplicate (B241161-DUP1) Source ID: WB03028-08									
Ammonia, as N					0.615	20	03/29/2024	ALN	D
Matrix Spike (B241161-MS1) Source ID: WB03028-08									
Ammonia, as N			101	84-115			03/29/2024	ALN	D
Matrix Spike (B241161-MS2) Source ID: EP00320-01									
Ammonia, as N			101	84-115			03/29/2024	ALN	
Matrix Spike (B241161-MS3) Source ID: AC00341-01									
Ammonia, as N			102	84-115			03/29/2024	ALN	
Matrix Spike Dup (B241161-MSD1) Source ID: WB03028-08									
Ammonia, as N			99.6	84-115	0.840	20	03/29/2024	ALN	D
Batch: B241163									
Blank (B241163-BLK1)									
Total Dissolved Solids	<20	mg/L					03/30/2024	BAK	U
LCS (B241163-BS1)									
Total Dissolved Solids			99.3	90-110			03/30/2024	BAK	
Duplicate (B241163-DUP1) Source ID: RW00064-08									
Total Dissolved Solids					7.62	10	03/30/2024	BAK	

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Quality Control Report

(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B241167									
Blank (B241167-BLK1)									
COD	<7	mg/L					03/29/2024	RKT	U
LCS (B241167-BS1)									
COD			98.3	90-110			03/29/2024	RKT	
Duplicate (B241167-DUP1)	Source ID: AC00341-01								
COD					3.64	10	03/29/2024	RKT	
Batch: B241168									
Blank (B241168-BLK1)									
BOD5	<2	mg/L					04/03/2024	ALM	U
LCS (B241168-BS1)									
BOD5			103	84.6-115.4			04/03/2024	ALM	
LCS (B241168-BS2)									
BOD5			106	84.6-115.4			04/03/2024	ALM	
Duplicate (B241168-DUP1)	Source ID: LS01908-02								
BOD5					3.16	30	04/03/2024	ALM	
Batch: B241172									
Blank (B241172-BLK1)									
Total Suspended Solids	<0.9	mg/L					03/29/2024	SMC	U
LCS (B241172-BS1)									
Total Suspended Solids			91.2	90-110			03/29/2024	SMC	
Duplicate (B241172-DUP1)	Source ID: LS01908-02								
Total Suspended Solids					0.951	20	03/29/2024	SMC	
Batch: B241189									
Blank (B241189-BLK1)									
Nitrate-Nitrite, as N	<0.025	mg/L					04/01/2024	JAL	U
LCS (B241189-BS1)									
Nitrate-Nitrite, as N			96.2	90-110			04/01/2024	JAL	
Duplicate (B241189-DUP1)	Source ID: AC00340-01								
Nitrate-Nitrite, as N					2.37	10	04/01/2024	JAL	
Matrix Spike (B241189-MS1)	Source ID: AC00340-01								
Nitrate-Nitrite, as N			97.6	90-110			04/01/2024	JAL	
Matrix Spike Dup (B241189-MSD1)	Source ID: AC00340-01								
Nitrate-Nitrite, as N			96.8	90-110	0.678	10	04/01/2024	JAL	

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(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Net Chemistry (Continued)									
Batch: B241263									
Blank (B241263-BLK1)									
TKN	<0.1	mg/L					04/05/2024	EDM	U
Blank (B241263-BLK2)									
TKN	<0.1	mg/L					04/05/2024	EDM	U
LCS (B241263-BS1)									
TKN			98.7	80-120			04/05/2024	EDM	
LCS (B241263-BS2)									
TKN			95.9	80-120			04/05/2024	EDM	
Duplicate (B241263-DUP1)	Source ID: AC00341-01								
TKN					4.82	20	04/05/2024	EDM	
Duplicate (B241263-DUP2)	Source ID: RW00065-02								
TKN					0.416	20	04/05/2024	EDM	D
Duplicate (B241263-DUP3)	Source ID: RW00065-07								
TKN					3.97	20	04/05/2024	EDM	D
Matrix Spike (B241263-MS1)	Source ID: AC00341-01								
TKN			102	80-120			04/05/2024	EDM	
Matrix Spike (B241263-MS2)	Source ID: RW00065-02								
TKN			101	80-120			04/05/2024	EDM	D
Matrix Spike (B241263-MS3)	Source ID: RW00065-07								
TKN			88.7	80-120			04/05/2024	EDM	D
Matrix Spike Dup (B241263-MSD1)	Source ID: AC00341-01								
TKN			97.7	80-120	3.03	20	04/05/2024	EDM	
Matrix Spike Dup (B241263-MSD2)	Source ID: RW00065-02								
TKN			98.7	80-120	1.20	20	04/05/2024	EDM	D
Matrix Spike Dup (B241263-MSD3)	Source ID: RW00065-07								
TKN			95.8	80-120	3.01	20	04/05/2024	EDM	D
Batch: B241409									
Blank (B241409-BLK1)									
Chloride	<0.015	mg/L					04/18/2024	SMC	U
Blank (B241409-BLK2)									
Chloride	<0.015	mg/L					04/19/2024	SMC	U
Blank (B241409-BLK3)									
Chloride	<0.015	mg/L					04/19/2024	SMC	U
LCS (B241409-BS1)									
Chloride			96.8	90-110			04/18/2024	SMC	
LCS (B241409-BS2)									
Chloride			96.2	90-110			04/18/2024	SMC	
LCS (B241409-BS3)									
Chloride			96.3	90-110			04/19/2024	SMC	

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(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Wet Chemistry (Continued)									
Batch: B241409 (Continued)									
Duplicate (B241409-DUP1) Chloride	Source ID: AC00340-01				0.0752	10	04/18/2024	SMC	
Duplicate (B241409-DUP2) Chloride	Source ID: RW00065-13				0.328	10	04/18/2024	SMC	D
Duplicate (B241409-DUP4) Chloride	Source ID: RW00069-11				0.239	10	04/19/2024	SMC	
Duplicate (B241409-DUP5) Chloride	Source ID: RW00070-08				0.923	10	04/19/2024	SMC	D
Duplicate (B241409-DUP6) Chloride	Source ID: RW00067-10RE1				0.341	10	04/20/2024	SMC	D
Matrix Spike (B241409-MS1) Chloride	Source ID: AC00340-01		97.9	90-110			04/18/2024	SMC	
Matrix Spike (B241409-MS2) Chloride	Source ID: RW00065-13		96.8	90-110			04/18/2024	SMC	D
Matrix Spike (B241409-MS4) Chloride	Source ID: RW00069-11		98.8	90-110			04/19/2024	SMC	
Matrix Spike (B241409-MS5) Chloride	Source ID: RW00070-08		98.2	90-110			04/19/2024	SMC	D
Matrix Spike (B241409-MS6) Chloride	Source ID: RW00067-10RE1		95.5	90-110			04/20/2024	SMC	D
Matrix Spike Dup (B241409-MSD1) Chloride	Source ID: AC00340-01		97.9	90-110	0.0119	10	04/18/2024	SMC	
Matrix Spike Dup (B241409-MSD2) Chloride	Source ID: RW00065-13		97.0	90-110	0.105	10	04/19/2024	SMC	D
Matrix Spike Dup (B241409-MSD4) Chloride	Source ID: RW00069-11		99.6	90-110	0.708	10	04/19/2024	SMC	
Matrix Spike Dup (B241409-MSD5) Chloride	Source ID: RW00070-08		98.8	90-110	0.380	10	04/19/2024	SMC	D
Matrix Spike Dup (B241409-MSD6) Chloride	Source ID: RW00067-10RE1		96.6	90-110	0.595	10	04/20/2024	SMC	D

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Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier		
Dissolved Wet Chemistry											
Batch: B241173											
Blank (B241173-BLK1) Orthophosphate, as P	<0.003	mg/L					03/29/2024	JAL	U		
Blank (B241173-BLK2) Orthophosphate, as P	<0.003	mg/L					03/29/2024	JAL	U		
LCS (B241173-BS1) Orthophosphate, as P			97.4	90-110			03/29/2024	JAL			
LCS (B241173-BS2) Orthophosphate, as P			98.8	90-110			03/29/2024	JAL			
Duplicate (B241173-DUP1) Orthophosphate, as P	Source ID: AC00340-01				0.151	10	03/29/2024	JAL			
Duplicate (B241173-DUP2) Orthophosphate, as P	Source ID: RW00064-08				0.870	10	03/29/2024	JAL	D		
Duplicate (B241173-DUP3) Orthophosphate, as P	Source ID: WB03032-06				0.481	10	03/29/2024	JAL	D		
Matrix Spike (B241173-MS1) Orthophosphate, as P	Source ID: AC00340-01				99.1	90-110	03/29/2024	JAL			
Matrix Spike (B241173-MS2) Orthophosphate, as P	Source ID: RW00064-08				99.9	90-110	03/29/2024	JAL	D		
Matrix Spike (B241173-MS3) Orthophosphate, as P	Source ID: WB03032-06				99.8	90-110	03/29/2024	JAL	D		
Matrix Spike Dup (B241173-MSD1) Orthophosphate, as P	Source ID: AC00340-01				98.4	90-110	0.459	10	03/29/2024	JAL	
Matrix Spike Dup (B241173-MSD2) Orthophosphate, as P	Source ID: RW00064-08				101	90-110	0.438	10	03/29/2024	JAL	D
Matrix Spike Dup (B241173-MSD3) Orthophosphate, as P	Source ID: WB03032-06				101	90-110	0.301	10	03/29/2024	JAL	D

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(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals									
Batch: B241177									
Blank (B241177-BLK1)									
Arsenic	<0.070	ug/L					04/14/2024	DMW	U
Cadmium	<0.010	ug/L					04/14/2024	DMW	U
Lead	<0.010	ug/L					04/14/2024	DMW	U
LCS (B241177-BS1)									
Arsenic			101	85-115			04/14/2024	DMW	
Cadmium			102	85-115			04/14/2024	DMW	
Lead			103	85-115			04/14/2024	DMW	
Duplicate (B241177-DUP1) Source ID: ES00308-04									
Arsenic					1.20	20	04/14/2024	DMW	
Cadmium					NR	20	04/14/2024	DMW	U
Lead					0.466	20	04/14/2024	DMW	
Matrix Spike (B241177-MS1) Source ID: ES00308-04									
Arsenic			100	70-130			04/14/2024	DMW	
Cadmium			101	70-130			04/14/2024	DMW	
Lead			101	70-130			04/14/2024	DMW	
Matrix Spike Dup (B241177-MSD1) Source ID: ES00308-04									
Arsenic			101	70-130	0.462	20	04/14/2024	DMW	
Cadmium			102	70-130	1.01	20	04/14/2024	DMW	
Lead			101	70-130	0.120	20	04/14/2024	DMW	
Batch: B241226									
Blank (B241226-BLK1)									
Calcium	<0.04	mg/L					04/11/2024	EDM	U
Magnesium	<80	ug/L					04/11/2024	EDM	U
Phosphorus as P	<0.012	mg/L					04/11/2024	EDM	U
LCS (B241226-BS1)									
Calcium			98.9	85-115			04/11/2024	EDM	
Magnesium			101	85-115			04/11/2024	EDM	
Phosphorus as P			102	85-115			04/11/2024	EDM	
Duplicate (B241226-DUP1) Source ID: AC00341-01									
Calcium					1.81	20	04/11/2024	EDM	
Magnesium					1.16	20	04/11/2024	EDM	
Phosphorus as P					2.27	20	04/11/2024	EDM	
Matrix Spike (B241226-MS1) Source ID: AC00341-01									
Calcium			100	70-130			04/11/2024	EDM	
Magnesium			102	70-130			04/11/2024	EDM	
Phosphorus as P			101	70-130			04/11/2024	EDM	
Matrix Spike Dup (B241226-MSD1) Source ID: AC00341-01									
Calcium			102	70-130	1.34	20	04/11/2024	EDM	
Magnesium			103	70-130	0.658	20	04/11/2024	EDM	
Phosphorus as P			103	70-130	1.62	20	04/11/2024	EDM	



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Quality Control Report

Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Total Metals (Continued)									
Batch: B241233									
Blank (B241233-BLK1)									
Mercury	<0.01	ug/L					04/05/2024	SAS	U
LCS (B241233-BS1)									
Mercury			104	85-115			04/05/2024	SAS	
Duplicate (B241233-DUP1) Source ID: AC00340-01									
Mercury					47.0	20	04/05/2024	SAS	QC-02
Duplicate (B241233-DUP2) Source ID: BB03721-01									
Mercury					NR	20	04/05/2024	SAS	U
Matrix Spike (B241233-MS1) Source ID: AC00340-01									
Mercury			97.8	70-130			04/05/2024	SAS	
Matrix Spike (B241233-MS2) Source ID: BB03721-01									
Mercury			101	70-130			04/05/2024	SAS	
Matrix Spike (B241233-MS3) Source ID: EP00317-02RE1									
Mercury			75.9	70-130			04/05/2024	SAS	D
Matrix Spike Dup (B241233-MSD1) Source ID: AC00340-01									
Mercury			91.3	70-130	5.80	20	04/05/2024	SAS	
Matrix Spike Dup (B241233-MSD2) Source ID: BB03721-01									
Mercury			102	70-130	1.06	20	04/05/2024	SAS	

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(Continued)

Analyte Name	Method Blank	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Analyzed	Analyst Initials	Qualifier
Dissolved Metals									
Batch: B241178									
Blank (B241178-BLK1)									
Cadmium	<0.010	ug/L					04/04/2024	DMW	U
Copper	<0.15	ug/L					04/04/2024	DMW	U
Lead	<0.0090	ug/L					04/04/2024	DMW	U
Zinc	<0.50	ug/L					04/04/2024	DMW	U
LCS (B241178-BS1)									
Cadmium			99.9	85-115			04/04/2024	DMW	
Copper			93.2	85-115			04/04/2024	DMW	
Lead			99.4	85-115			04/04/2024	DMW	
Zinc			94.5	85-115			04/04/2024	DMW	
Duplicate (B241178-DUP1) Source ID: AC00340-01									
Cadmium					NR	10	04/04/2024	DMW	U
Copper					0.527	10	04/04/2024	DMW	
Lead					2.01	10	04/04/2024	DMW	
Zinc					1.59	10	04/04/2024	DMW	
Matrix Spike (B241178-MS1) Source ID: AC00340-01									
Cadmium			102	70-130			04/04/2024	DMW	
Copper			91.6	70-130			04/04/2024	DMW	
Lead			98.4	70-130			04/04/2024	DMW	
Zinc			91.2	70-130			04/04/2024	DMW	
Matrix Spike Dup (B241178-MSD1) Source ID: AC00340-01									
Cadmium			102	70-130	0.490	10	04/04/2024	DMW	
Copper			91.9	70-130	0.188	10	04/04/2024	DMW	
Lead			98.3	70-130	0.146	10	04/04/2024	DMW	
Zinc			89.8	70-130	0.970	10	04/04/2024	DMW	

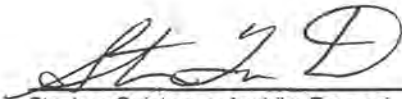


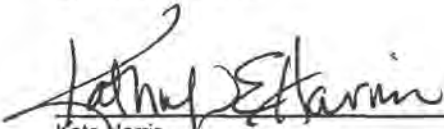
Notes and Definitions

Item	Definition
	Data reported from a dilution
IC-02	The RPD is greater than the method acceptance criteria. At least one of the values used to calculate the RPD, is less than or equal to the PQL.
	Analyte included in the analysis, but not detected

Method Reference Acronyms

Colilert	Colilert, IDEXX Laboratories, Inc.
EPA	Manual of Methods for Chemical Analysis of Water and Wastes, USEPA
GS	USGS Techniques of Water-Resources Investigations
HH	Hach Spectrophotometer Procedures Manual
SM	Standard Methods for the Examination of Water and Wastewater
SW	Test methods for Evaluating Solid Waste, SW-846


Stephen Quintero or Azubike Emenari
QA/QC Coordinator


Kate Harris
Interim Water Quality Laboratory Manager

Ada County Highway District

Attn: Steven Turner
3775 Adams Street
Garden City, Idaho 83714-6418
Tel. (208) 387-6269
Fax (208) 387-6391
Purchase Order:
Project:
Sampler(s):

63065628
Stormwater-PI
Kristen Chisholm
#Steven Turner

Lab#	Begin Date	End Date	Begin Time	End Time	Sample Identification	Sampler Initials	Water	Grab	Composite	BOD ₅ - SM 5210	COD - Hach 8000	TSS - SM 2540C	TDS - SM 2540C	TKN - EPA 351.2	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.8	Diss. Cd Cu, Pb, Zn - EPA 200.8	Total Hg - EPA 245.2	~~E. Coli - IDEXX GelPoint~~ - Chlorides EPA 300.0	Turbidity - EPA 180.1	Hardness - EPA 200.7	NO ₃ +NO ₂ - EPA 353.2	NH ₃ - SM 4500 NH ₃ -D	Total Contained
00340-01	3/27/24	3/28/24	1933	0739	~~23~~ 240328-12-WC	KC	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3
↓ -02		3/28/24		1200	240328-14- ~~WE~~ 002	KC	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1

Relinquished by (sign)	Date & Time Transferred	Received by (sign)	Comments/Special Instructions:
Kristen Chisholm	3/28/24 1130	Steven Turner 3/28/24 1134	

Appendix 8

Americana Subwatershed Summary WY 2024

Americana Subwatershed Monitoring Summary Report

Water Year 2024

Prepared by
Brown and Caldwell

Prepared for
Ada County Highway District
December 19, 2024



This document was prepared solely for ACHD in accordance with professional standards at the time the services were performed and in accordance with the contract between ACHD and Brown and Caldwell dated September 12, 2024. This document is governed by the specific scope of work authorized by ACHD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ACHD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Americana Subwatershed Monitoring Summary WY 2024

Ada County Highway District
12/19/2024

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Section 1: Introduction

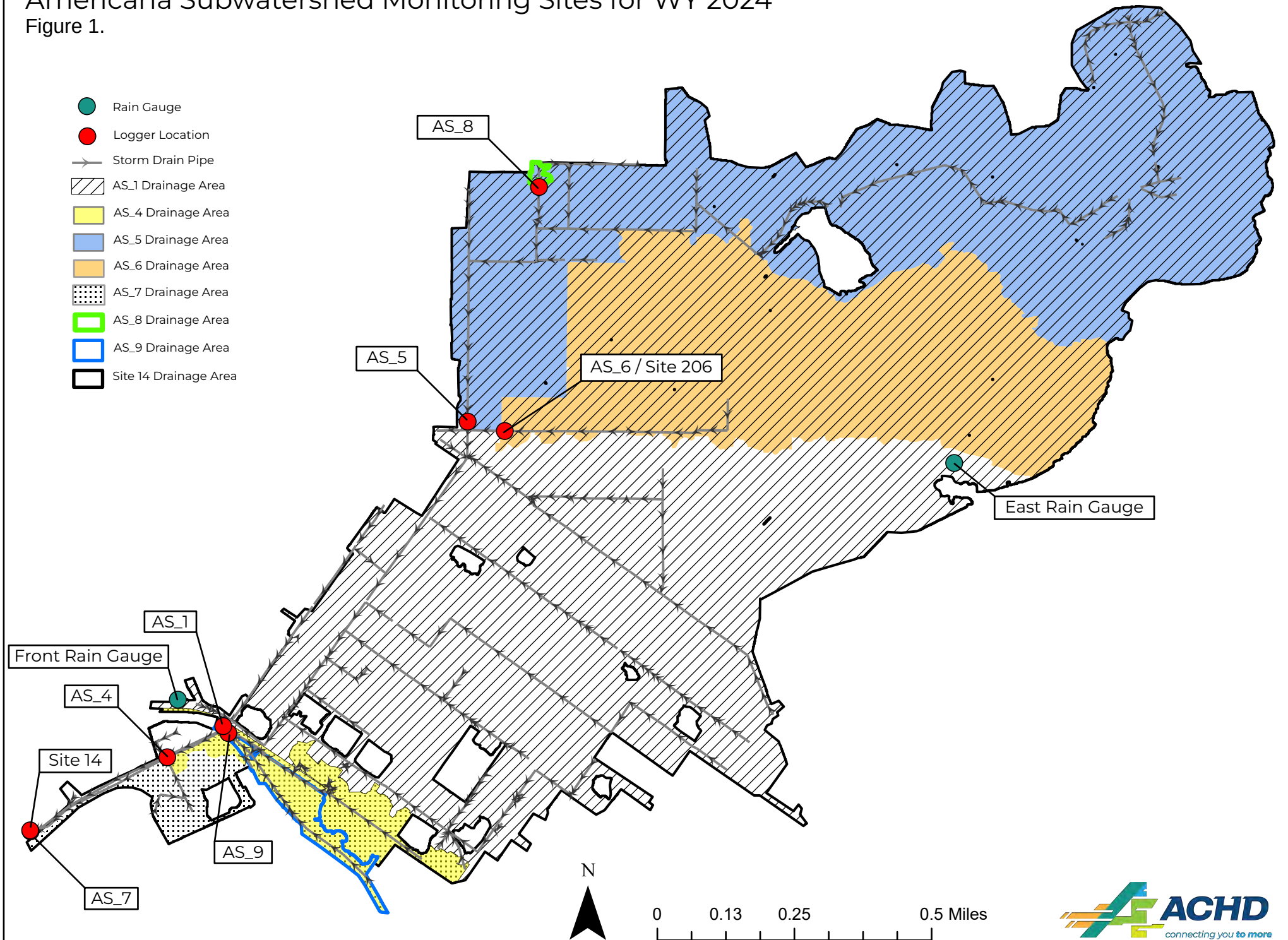
Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Permittees) were issued a National Pollutant Discharge Elimination System Phase I Permit #IDS-027561 (Permit) on October 1, 2021. The Permit authorizes the Permittees to discharge from municipal separate storm sewer system outfalls to the Boise River and its tributaries. According to Permit Part 6.2.2, *Subwatershed Monitoring*, Permittees are required to conduct monitoring within the Americana subwatershed to better define wet weather and dry weather flow volumes, sources, and pollutant loads.

The Americana subwatershed is one of the largest urban subwatersheds on the lower Boise River and drains a significant portion of downtown Boise and the North End and Foothills residential areas. Stormwater discharge monitoring (flow measurement and analytical sample collection) is currently conducted at the Americana outfall as identified in the [Stormwater Outfall Monitoring Plan](#) (ACHD, 2022). While data collected at the outfall is important for understanding discharges to the Boise River, the dataset does not provide much information about the pollutant load and dry weather sources farther up in the storm drain system. Guided by the [Americana Subwatershed Plan](#) (ACHD, 2020), the Americana subwatershed is divided into subcatchments at major nodes in the system to parse out non-stormwater flow sources and characterize pollutant contributions. The following summary describes Americana subwatershed monitoring activities during water year (WY) 2024 (October 1, 2023–September 30, 2024).

In WY 2024, data collection throughout the Americana subwatershed included precipitation, water level, flow, and water quality samples. Precipitation data were collected at two representative locations, and water level data were collected at six subwatershed locations and at the Americana monitoring station. The water level data were compared to the precipitation data to look for anomalies in the municipal separate storm sewer system, such as instances when the water level in pipe increases or decreases without a corresponding precipitation event and when the water level increases from isolated subcatchment areas. Additionally, water quality data from wet weather discharges were collected from one subcatchment site (Site 206) to compare with the Americana outfall site (Site 14). The water quality data, along with flow data, were used to calculate pollutant loads and identify pollutants discharging from Site 206 that are disproportionately high compared to Site 14.

Americana Subwatershed Monitoring Sites for WY 2024

Figure 1.



Section 2: Monitoring Sites, Equipment, and Sample Types

Data was collected at the following monitoring sites during WY 2024: AS_1, AS_4, AS_7, AS_8, AS_9, Site 14, Site 206, Front, and East (Figure 1). Details on each of the monitoring sites, including subcatchment areas, pipe characteristics, and equipment deployment start and end dates, are found in Table 1. Figure 2 shows the locations of the monitoring sites in relation to each other using a conceptual layout of the storm drain system. Midway through WY 2023, the AS_5 and AS_6 logger sites were discontinued.

Site 14 is the Americana outfall monitoring station used in the National Pollutant Discharge Elimination System Phase I Stormwater Outfall Monitoring program. This monitoring site is equipped with a flowmeter and sampler to collect water level, velocity, flow, and composite samples. Water level, velocity, and flow data are collected at 15-minute intervals during dry weather and 1-minute intervals when the equipment is set up to monitor a forecasted storm event.

Site 206 is a subcatchment of the Americana subwatershed. Similar to Site 14, it is equipped with a flowmeter and sampler to collect flow and water quality data during targeted storm events.

AS_7 is a secondary outfall to Site 14, with a connection between storm drain pipes farther up in the system. This site is equipped with a flowmeter to capture continuous water level, velocity, and flow data at 5-minute intervals.

The AS_8 site was installed during the second quarter of WY 2023 to replace AS_5. The AS_8 subwatershed is much smaller than the AS_5 subwatershed; however, it still captures Hull's Gulch flows into the Americana storm drain system.

The AS_9 site was added to measure dry weather flow at AS_4 by splitting the subwatershed into two areas, with AS_9 representing the upstream portion of the AS_4 subwatershed.

The AS_6 logger site was discontinued in the second quarter of WY 2023; however, Site 206 still collects flow and water quality data during targeted storm events.

AS_1, AS_4, AS_8, and AS_9 represent subcatchment areas within the Americana subwatershed. Each site is equipped with a water level logger to collect in-pipe water level data. The loggers continuously record pressure readings at 5-minute intervals. The pressure readings are corrected using local barometric pressure and converted to water level.

Front and East are rain gauge sites and are equipped with tipping bucket rain gauges. The rain gauges collect continuous precipitation data in 0.01-inch increments using event data loggers. The precipitation data are used to determine the date and times of wet weather storm events and dry weather periods.

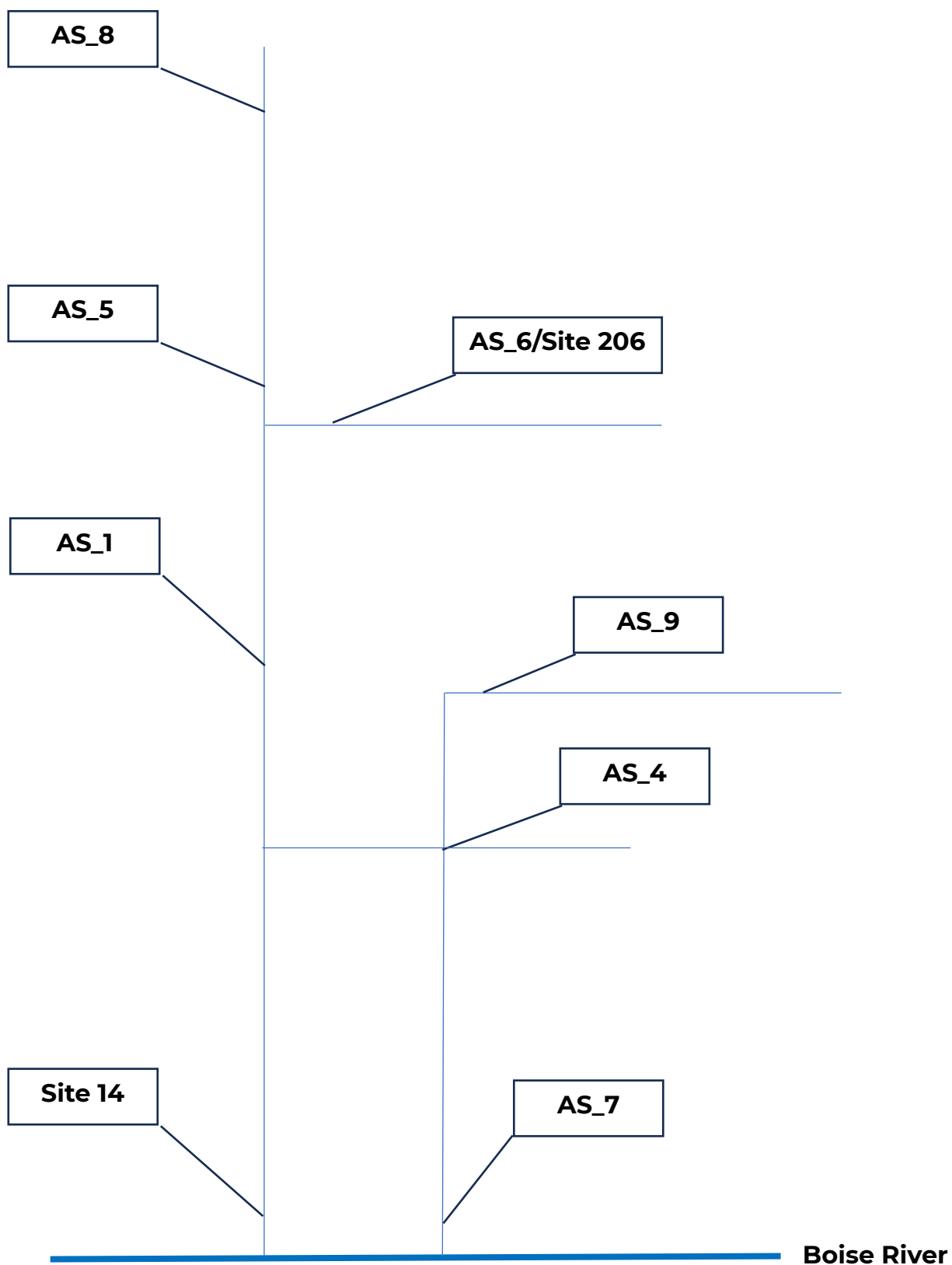


Figure 2. Conceptual Layout of Monitoring Sites

2.1 Water Quality Sample Types

The sample types collected during WY 2024 include grab samples and composite samples. Grab samples represent a discrete measurement from the overall storm discharge while composite samples represent the entire discharge.

Grab samples were manually collected from wet weather discharges using a swing sampler. The grab samples were submitted to the Boise City Public Works Water Quality Laboratory (WQL) and analyzed for *E. coli*. At the time that the grab samples were collected, field parameters (temperature, pH, dissolved oxygen, and conductivity) were measured using In-Situ smarTROLL or In-Situ Aqua TROLL handheld instruments.

Composite samples were collected using automatic samplers, which worked in conjunction with flowmeters. After a predetermined volume of flow was discharged, the flowmeters triggered the sampler to collect a subsample. Each subsample was deposited into a 15-liter carboy, resulting in a flow-proportional composite sample. The composite samples were submitted to WQL where they were split for analysis. The following constituents were analyzed: biological oxygen demand, 5-day (BOD₅); chemical oxygen demand (COD); hardness as calcium carbonate (CaCO₃); turbidity; total suspended solids (TSS); total dissolved solids (TDS); total phosphorus (TP); orthophosphate as P; ammonia, as N; nitrate + nitrite, as N; total Kjeldahl nitrogen (TKN); total arsenic; dissolved and total cadmium; dissolved copper; dissolved and total lead; total mercury; and dissolved zinc.

Section 3: Americana Subwatershed Monitoring Results

This section describes water level monitoring results and water quality results and provides high-level conclusions and outcomes based on WY 2024 data.

3.1 Water Level Monitoring Results

For WY 2024, water level data from six monitoring sites (AS_1, AS_4, AS_7, AS_8, AS_9, and Site 14) were evaluated for occurrences of increasing or decreasing water level not attributed to precipitation. Though the pipe size at each site differs, the change in water level is still evident in the data. When a change in water level is seen at one or more sites, the discharge must originate from the site that is farthest “up pipe” in the storm drain system. Figures 3–6 show hydrographs for each quarter of WY 2024. Color bands were applied to the hydrographs to indicate periods where no rain was recorded, but the water level fluctuated at one or more sites. Fluctuations of less than 2 hours were not included in the analysis as non-stormwater sources. Fluctuations lasting more than 72 hours are marked as extended periods of non-stormwater flow and are denoted in the hydrographs with hatched color bands. The following conclusions were extracted from visually inspecting the hydrographs:

- Sudden water level increases and decreases were observed, which are likely caused by human-related activities such as turning on a pump or opening a headgate.
- Reoccurring water level spikes were observed at AS_7 between 2330 and 0900. Similar spikes were observed in the second and third quarters of WY 2023. Therefore, AS_7 water level spikes were omitted from WY 2024 quarterly summaries, unless the AS_7 water level spike aligned with another site(s). An investigation on the source of level spikes at AS_7 is ongoing.
- Concurrent water level increases and decreases were observed at AS_1 and AS_4 but not in AS_9. Using the conceptual pipe layout in Figure 2 as a reference, it becomes apparent that there must be a different pipe connection farther in the AS_4 subcatchment area causing water

level anomalies. An investigation to confirm the location of the pipe in the AS_4 subcatchment area is ongoing.

- Based on historical Google Earth imagery, significant building and road construction activities have been observed in the AS_4 subwatershed area.
- An extended period of non-stormwater flow originating from AS_1 subcatchment (which includes downtown Boise) occurred on November 22, 2023, through November 27, 2023 (approx. 6 days).
- An extended period of non-stormwater flow originating from AS_8 subcatchment occurred on February 8, 2023, through February 13 (approx. 6 days). The non-stormwater source is likely snow melt in Hull's Gulch. A non-extended, non-stormwater discharge originating from AS_8 occurred once on February 26, 2024.
- Non-stormwater discharge originated from the AS_1 subcatchment 50 times, with the most anomalies generally occurring in the third quarter (36 percent)
- Non-stormwater discharge originated from AS_4 subcatchment 40 times, with the most anomalies generally occurring in the fourth quarter (38 percent)
- No anomalies were found at Site 14 and AS_9.

3.2 Water Quality Monitoring Results

During WY 2024, water quality samples from wet weather discharges were collected from one subcatchment site (Site 206) to compare with the Americana outfall site (Site 14). Samples were collected from five storm events. A summary of the storm dates and sample types collected is provided in Table 3-1. Attempts were made to collect samples from both Site 14 and Site 206 during the same storm event. When paired samples were successfully collected from both sites, the water quality results were directly compared to one another. Results from samples that were collected from only one of the two sites were omitted from the subsequent discussion; however, the values will be used when calculating statistics for the final report. Comprehensive analytical results from all samples collected are included in Table 2, attached.

Table 3-1. Storm Event Summary		
Storm Event Date	Site 14	Site 206
10/10/23	Grab, composite ¹	–
11/19/23	Grab ² , composite	Grab, composite
02/01/24	Grab ³ , composite	Grab ³ , composite
02/26/24	Grab, composite	Grab, composite
03/28/24	Grab	Grab

– No data

¹ Composite sample qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

² Incomplete field parameter collection on the grab sample data form due to field error.

³ E. coli sample qualified due to exceeded hold time.

3.2.1 Grab Samples

Paired grab samples were collected from Site 14 and Site 206 on November 19, 2023; February 26, 2024; and March 28, 2024. *E. coli* and temperature results were compared from the samples collected on November 19, 2023. On February 26, 2024, and March 28, 2024, the samples were analyzed for *E. coli*, temperature, pH, dissolved oxygen, and conductivity. Notable conclusions from each storm event are provided below.

November 19, 2023

- *E. coli* at Site 206 was approximately one time higher than at Site 14.
- Field parameters (pH, dissolved oxygen, and conductivity) were not collected for Site 14 during sampling event due to field error.

February 26, 2024

- *E. coli* at Site 14 was approximately two times higher than at Site 206.
- Specific conductivity at Site 14 was nearly four times higher than Site 206.

March 28, 2024

- *E. coli* at Site 206 was approximately one time higher than at Site 14.
- Specific conductivity at Site 14 was two times higher than at Site 206

3.2.2 Composite Samples

Paired composite samples were collected from Site 14 and Site 206 on November 19, 2023; February 1, 2024; and February 26, 2024.

Event-specific pollutant loads for each analyzed constituent were calculated by multiplying the volume of discharge as measured at the site by the constituent concentration. The pollutant loads, in pounds, are in Table 3, attached.

To evaluate the contribution Site 206 had on the overall pollutant load discharging from the Americana outfall, the percentage of the pollutant load was compared to the percentage of discharge volume. When the percentage of the pollutant load is greater than the percentage of discharge volume, the pollutant load discharging from the subcatchment is disproportionately high. This logic statement is illustrated below.

$$\begin{array}{c} \text{IF} \\ \frac{\text{pollutant load (lbs) from subcatchment}}{\text{pollutant load (lbs) from outfall}} > \frac{\text{discharge volume (cf) from subcatchment}}{\text{discharge volume (cf) from outfall}} \\ \text{THEN} \\ \text{pollutant load from subcatchment is disproportionately high} \end{array}$$

The percent contribution of pollutant load and the percent contribution of discharge volume were calculated for both Site 206 and Site 14 from each storm event (Figures 7, 8, and 9). The graphs include a vertical orange line indicating the value for the percent of discharge. Constituent loads that exceed the orange line are disproportionately high. Noteworthy outcomes from each paired storm event are presented below.

November 19, 2023

- Load contributions from Site 206 were disproportionately high for all constituents except for the following parameters: hardness as CaCO₃; nitrate + nitrite, as N; total arsenic; total cadmium; and total mercury.
- The percent pollutant load from Site 206 was approximately 5.5 times higher than the percent of discharge volume for dissolved lead.
- The percent pollutant load from Site 206 was between 3.5 to 4.0 times higher than the percent discharge volume for the following parameters: BOD₅ and orthophosphate as P.

- The percent pollutant load from Site 206 was between 3.0 to 3.5 times higher than the percent discharge volume for the following parameters: total phosphorus and COD.
- The percent pollutant load from Site 206 was between 2.0 to 2.5 times higher than the percent discharge volume for the following parameters: TKN and dissolved zinc.
- The percent pollutant load from Site 206 was between 1.5 to 2.0 times higher than the percent discharge volume for the following parameters: TDS, dissolved copper, and total lead.

February 1, 2024

- Load contributions from Site 206 were disproportionately high for all constituents except for the following parameters: hardness as CaCO_3 ; TDS; ammonia, as N; nitrate + nitrite, as N; total arsenic; dissolved cadmium; and dissolved zinc.
- The percent pollutant load from Site 206 was approximately 3 times higher than the percent of discharge volume for dissolved lead.
- The percent pollutant load from Site 206 was between 2.0 to 2.5 times higher than the percent discharge volume for the following parameters: total phosphorus and orthophosphate as P.
- The percent pollutant load from Site 206 was between 1.5 to 2.0 times higher than the percent discharge volume for the following parameters: BOD_5 , COD, TKN, total lead, and total mercury.

February 26, 2024

- Load contributions from Site 206 were disproportionately high for all constituents except for the following parameters: hardness as CaCO_3 ; TDS, nitrate + nitrite, as N; total arsenic; dissolved cadmium; total cadmium; and dissolved zinc.
- The percent pollutant load from Site 206 was approximately 3.5 times higher than the percent of discharge volume for dissolved lead.
- The percent pollutant load from Site 206 was approximately 2.5 times higher than the percent of discharge volume for orthophosphate as P.
- The percent pollutant load from Site 206 was between 1.5 to 2.0 times higher than the percent discharge volume for the following parameters: total phosphorus, TKN, and total lead.

Tables

Table 1. Monitoring Site Information

Table 2. Field and Analytical Data Summary

Table 3. Event Pollutant Loading Estimates in Pounds

Table 1. Monitoring Site Information															
Location Name	Study ID	Latitude/ Longitude	Manhole ID (SWMM File)	Manhole ID (Americana Manholes Files)	Subcatchment Total Area (acres)	Subcatchment Impervious Area (acres)	Pipe Diameter (in)	Pipe Construction	Manning's Coefficient (n value)	Pipe Slope	Water Level During Installation (in)	Equipment ID	Equipment Deploy Start Date	Equipment Deploy End Date	Installation Notes
Americana Monitoring Station	Site 14	Americana Monitoring Station	NA	NA	915	291	48	concrete	NA	NA	NA	Hach Flowmeter (FL-23)	2013	9/8/2020	
												Hach Sampler (SA-17)	2013	9/8/2020	
												ISCO Signature Flowmeter (FL-29)	9/8/2020	NA	
												ISCO 6712 Sampler (SA-20)	9/8/2020	NA	
16th_Front	AS_1	43°37'7.57"N 116°12'52.66"W	J87872	33634	869	255	42	concrete	0.015	0.0001	4.13	HOBO Logger (SN:20029104)	8/10/2018	9/15/2023	Logger installed downstream of manhole with conduit facing downstream
												ISCO 2150 Flowmeter (FL-21)	10/25/2019	1/24/2020	
												HOBO Logger (SN:20029102)	9/15/2023	11/7/2023	
												HOBO Logger (SN:20029105)	11/7/2023	NA	
Americana_River_South	AS_2	43°37'4.63"N 116°13'0.20"W	J5567	35568	39	28	42	concrete	0.015	0.0001	1.5	HOBO Logger (SN:20029109)	8/10/2018	4/28/2020	Large pipe downstream of manhole (south) that leads to secondary outfall with conduit facing downstream flow
Americana_River_East	AS_3	43°37'4.63"N 116°13'0.20"W	J5567	35568	10	5	16	concrete	0.015	0.0001	2	HOBO Logger (SN:20029106)	8/10/2018	1/6/2021	Small pipe upstream of manhole (east) with conduit facing upstream
Americana_River	AS_4	43°37'4.63"N 116°13'0.20"W	J5567	35568	29	23	42	concrete	0.015	0.0001	NA	HOBO Logger (SN:20029101)	8/10/2018	3/7/2024	Large pipe upstream of manhole (north) with conduit perpendicular to flow
											2.7	ISCO 2150 Flowmeter (FL-21)	7/10/2020	3/5/2021	Water level at installation: 2.7 inches
											2	HOBO Logger (SN:20029102)	3/7/2024	4/2/2024	Water level at installation: 2.0 inches
											3	HOBO Logger (SN:21904490)	4/2/2024	NA	Water level at installation: 3.0 inches
15th_Resseguie	AS_5	43°37'36.17"N 116°12'21.10"W	J5577	23810	289	49	30	concrete	0.015	0.0001	1.5	HOBO Logger (SN:20029105)	8/10/2018	2/17/2023	Logger installed downstream of manhole with conduit facing downstream
14th_Resseguie	AS_6/ Site 206	43°37'35.73"N 116°12'16.60"W	J16834	13187	206	23	22	corrugated metal	0.024	0.0001	NA	HOBO Logger (SN:20029102)	8/17/2018	3/7/2023	Installed downstream of vault
					203	22	22	corrugated metal	0.024	0.0001	NA	Hach Flowmeter (FL-25)	1/23/2020	3/4/2020	Installed upstream of vault, has smaller drainage area than HOB0 logger
												Hach Flowmeter (FL-18)	3/4/2020	4/18/2024	
												Hach Sampler (SA-11)	1/23/2020	10/9/2020	
												Hach Sampler (SA-13)	10/9/2020	12/10/2021	Installed upstream of vault, has smaller drainage area than HOB0 logger
												Hach Sampler (SA-09)	12/10/2021	4/18/2024	
												ISCO Signature Flowmeter (FL-31)	9/18/2024	NA	
												ISCO 6712 Sampler (SA-17)	9/18/2024	NA	
Americana East	AS_7	43°36'57.66"N 116°13'17.75"W	NA	NA	40	30	42	concrete	0.015	0.0001	NA	ISCO 2150 Flowmeter (FL-20)	1/11/2019	NA	ISCO flowmeter installed
13th_Lemp to Heron	AS_8	43°37'59.05" 116°12'11.83"	NA	NA	1	0	36	corrugated metal	0.024	0.0001	NA	HOBO logger (SN: 20029106)	2/24/2023	11/7/2023	
												HOBO logger (SN:20029104)	11/7/2023	NA	
16th_Rhodes	AS_9	43°37'7.18" 116°12'52.07"	NA	NA	10	5	21	concrete	0.015	0.0001	NA	HOBO logger (SN:20029109)	2/24/2023	4/2/2024	
												HOBO logger (SN:21904491)	4/2/2024	NA	

Table 2. Field and Analytical Data Summary																												
Sample Date	Monitoring Station	Sample ID Grab	Field Parameters				Analytical Parameters																					
			Dissolved Oxygen	pH	Conductivity	Temperature	E. coli	Sample ID Composite	BOD ₅	COD	Chloride	Hardness as CaCO ₃	Turbidity	TSS	TDS	Total Phosphorus	Orthophosphate as P	Ammonia as N	Nitrate + Nitrite as N	TKN	Arsenic, total	Cadmium, dissolved	Cadmium, total	Copper, dissolved	Lead, dissolved	Lead, total	Mercury, total	Zinc, dissolved
			mg/L	S.U.	µS/cm	C	MPN/100 mL		mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
10/10/2023	Site 14	231010-14-WG	8.40	6.53	247.08	16.78	129.6	231010-14-WC	19.7 ^{2j}	77.0 ^{2j}	--	<0.100 ^{2j}	33.6 ^{2j}	23.6 ^{2j}	236 ^{2j}	0.308 ^{2j}	0.169 ^{2j}	0.353 ^{2j}	0.930 ^{2j}	1.44 ^{2j}	5.5 ^{2j}	0.021 ^{2j}	0.072 ^{2j}	8.2 ^{2j}	0.095 ^{2j}	2.4 ^{2j}	< 0.0100 ^{2j}	22.0 ^{2j}
11/19/2023	Site 14	231119-14-WG	_ ^{3j}	_ ^{3j}	_ ^{3j}	14.16	1340.0	231119-14-WC	36.5	94.0	--	57.8	15.0	21.7	153	0.504	0.402	0.454	0.614	1.27	2.1	0.022	0.061	4.0 ¹	0.11	1.9	< 0.0100	27.2
	Site 206	231119-206-WG	9.44	7.18	184.28	9.04	1732.9	231119-206-WC	162	329	--	43.3	21.1	28.7	263	2.06	1.71	0.563	0.136	3.17	1.7	0.029	0.059	8.5	0.93	3.3	< 0.0100	61.8
2/1/2024	Site 14	240201-14-WG	10.05	7.73	552.2	8.34	65.0 ^{4j}	240201-14-WC	6.98	55.0	64.1	93.3	89.6	50.7	224	0.213	0.116	0.193	0.905	1.05	3.4	0.016	0.063	3.4 ¹	0.090	4.2	< 0.0100	17.3
	Site 206	240201-206-WG	9.33	8.03	542.9	5.55	290.9 ^{4j}	240201-206-WC	11.6	108	14.5	16.8	143	70.3	116	0.464	0.285	0.159	0.191	1.83	3.0	0.013	0.077	4.5	0.29	6.7	0.0168	10.5
2/26/2024	Site 14	240226-14-WG	10.54	7.53	470.55	8.74	125.9	240226-14-WC	12.6	85.0	56.1	102	51.1	54.3	214	0.276	0.106	0.496	0.940	1.47	3.3	0.021	0.097	4.0 ¹	0.063	3.9	0.0148	24.3
	Site 206	240226-206-WG	9.39	7.44	124.28	6.49	53.7	240226-206-WC	17.7	122	9.39	22.2	75.5	75.8	85.8	0.570	0.289	0.522	0.278	2.43	2.2	0.016	0.087	5.0	0.26	6.3	0.0183	20.2
3/28/2024	Site 14	240328-14-WG	10.57	7.28	255.40	9.79	365.4	240328-14-WC	-	-	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Site 206	240328-206-WG	9.92	7.60	108.59	7.74	387.3	240328-206-WC	-	-	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- No data

¹ Analytical parameter is qualified due to being less than five times the value detected in the rinsate blank. See Table 6 in the WY 2024 Stormwater Outfall Monitoring Summary for rinsate blank results.

^{2j} Data qualified due to lack of representativeness (50%–75%) of the calculated flow volume.

^{3j} Incomplete field parameter collection on the grab sample form due to field error.

^{4j} E. coli sample qualified due to exceeded hold time.

Table 3. Event Pollutant Loading Estimates in Pounds																				
Event Date	BOD ₅		COD		Hardness as CaCO3		Turbidity		TSS		TDS		Total Phosphorus		Orthophosphate as P		Ammonia as N		Nitrate + Nitrite as N	
	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206
11/19/2023	723	215	1861	436	1144	57.3	0.0	0.0	430	38.0	3029	348	10.0	2.73	7.96	2.26	8.99	0.746	12.2	0.180
2/1/2024	114	11.5	895	107	1518	16.7	0.0	0.0	825	69.8	3644	115	3.46	0.461	1.89	0.283	3.14	0.158	14.7	0.190
2/26/2024	110	6.02	743	41.5	891	7.55	0.0	0.0	474	25.8	1870	29.2	2.41	0.194	0.926	0.098	4.33	0.177	8.21	0.0945

Table 3. Event Pollutant Loading Estimates in Pounds																		
Event Date	TKN		Arsenic, total		Cadmium, dissolved		Cadmium, total		Copper, dissolved		Lead, dissolved		Lead, total		Mercury, total		Zinc, dissolved	
	mg/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206	Site 14	Site 206
11/19/2023	25.1	4.20	0.0416	0.00225	0.000436	0.0000384	0.00121	0.0000781	0.0792	0.0113	0.00218	0.00123	0.0376	0.00437	0.000198	0.0000132	0.538	0.0818
2/1/2024	17.1	1.82	0.0553	0.00298	0.000260	0.0000129	0.00102	0.0000765	0.0553	0.00447	0.00146	0.000288	0.0683	0.00665	0.000163	0.0000167	0.281	0.0104
2/26/2024	12.8	0.826	0.0288	0.000748	0.000183	0.00000544	0.000848	0.0000296	0.0350	0.00170	0.000550	0.0000884	0.0341	0.00214	0.000129	0.00000622	0.212	0.00687

Figures

Figure 3. Americana Subwatershed Water Level WY 2024 October–November

Figure 4. Americana Subwatershed Water Level WY 2024 January–March

Figure 5. Americana Subwatershed Water Level WY 2024 April–June

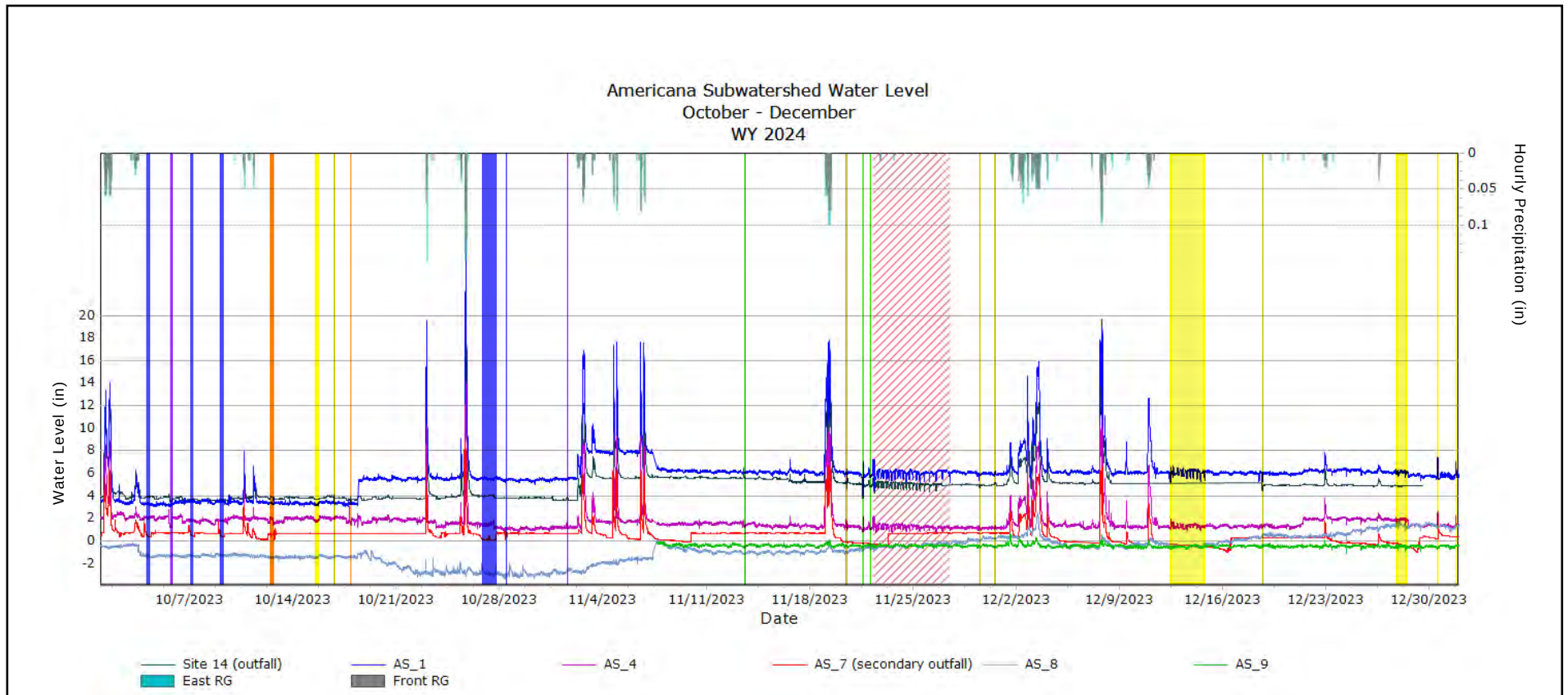
Figure 6. Americana Subwatershed Water Level WY 2024 July–September

Figure 7. Percent Contribution for Storm Event 11/19/2023

Figure 8. Percent Contribution for Storm Event 2/1/2024

Figure 9. Percent Contribution for Storm Event 2/26/2024

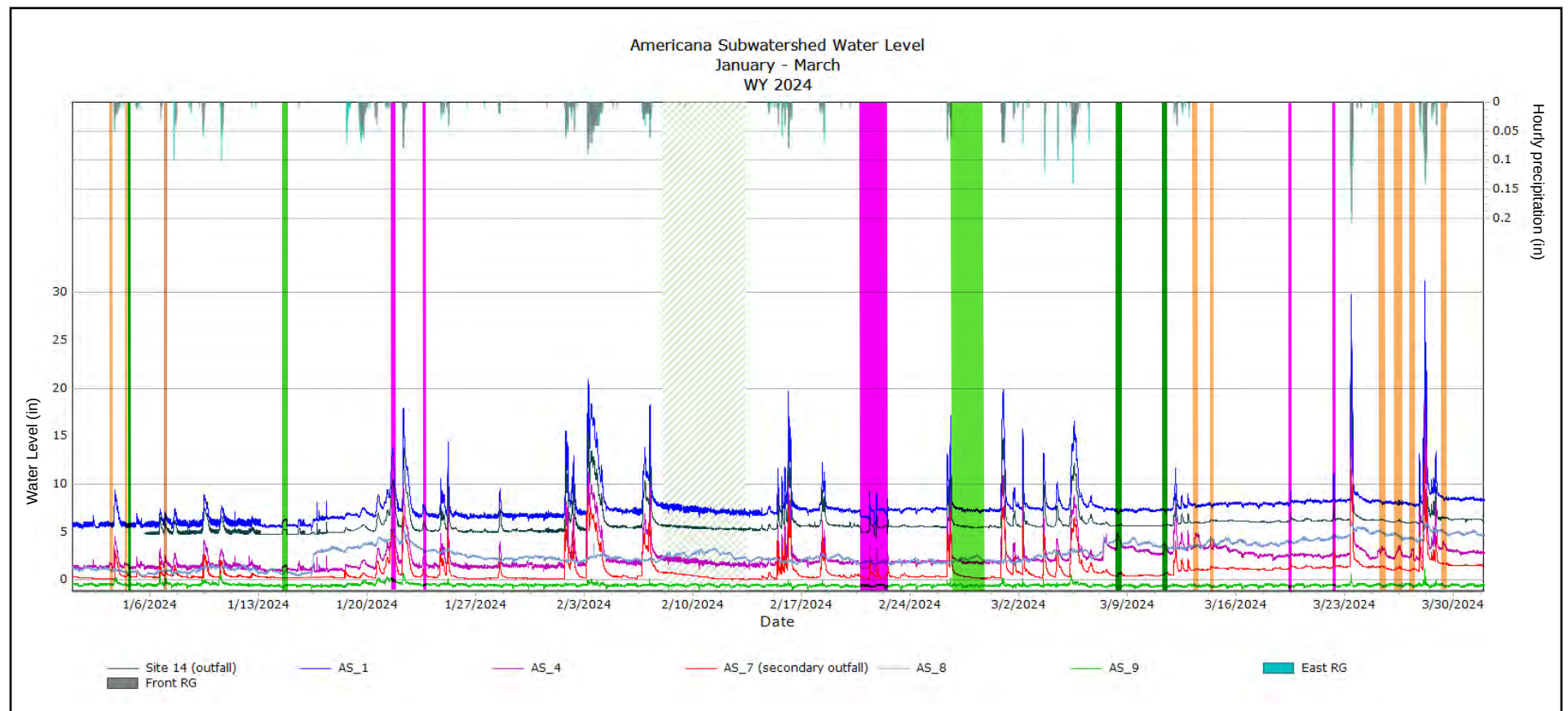
Americana Subwatershed Review WY24 Q1
Figure 3.



Americana Subwatershed Review WY24 Q1

Color Code	Beginning Date Time	Duration (hrs)	Sites Included	Non-stormwater source
	10/3/2023 23:00:00	10.5	AS_7	AS_7 Subcatchment
	10/5/2023 15:00:00	6.0	AS_4, Site 14	AS_4 Subcatchment
	10/6/2023 23:00:00	9.5	AS_7	AS_7 Subcatchment
	10/8/2023 23:00:00	10.0	AS_7	AS_7 Subcatchment
	10/12/2023 8:00:00	10.0	AS_4, AS_7, Site 14	AS_4 Subcatchment
	10/15/2023 10:00:00	10.0	AS_1, AS_4	AS_1 Subcatchment
	10/16/2023 18:30:00	2.0	AS_1, Site 14	AS_1 Subcatchment
	10/17/2023 20:30:00	3.0	AS_4	AS_4 Subcatchment
	10/26/2023 18:30:00	25.0	AS_7	AS_7 Subcatchment
	10/28/2023 8:00:00	5.0	AS_7	AS_7 Subcatchment
	11/1/2023 13:00:00	2.5	AS_4, Site 14	AS_4 Subcatchment
	11/13/2023 13:00:00	2.5	AS_1, AS_4, Site 14	AS_1 Subcatchment
	11/20/2023 9:00:00	4.0	AS_4	AS_4 Subcatchment
	11/20/2023 13:00:00	2.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	11/21/2023 13:00:00	4.5	AS_1, AS_4, Site 14	AS_1 Subcatchment
	11/22/2023 0:00:00	3.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	11/22/2023 7:00:00	127.0	AS_1, AS_4, Site 14 (elongated)	AS_1 Subcatchment
	11/29/2023 12:00:00	2.0	AS_1, Site 14	AS_1 Subcatchment
	11/30/2023 12:00:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	12/12/2023 8:00:00	60.0	AS_1, AS_4	AS_1 Subcatchment
	12/18/2023 15:00:00	2.5	AS_1, Site 14	AS_1 Subcatchment
	12/27/2023 15:30:00	22.5	AS_1, AS_4	AS_1 Subcatchment
	12/30/2023 13:00:00	2.0	AS_1, AS_4	AS_1 Subcatchment
	12/31/2023 18:00:00	2.5	AS_1, AS_4	AS_1 Subcatchment

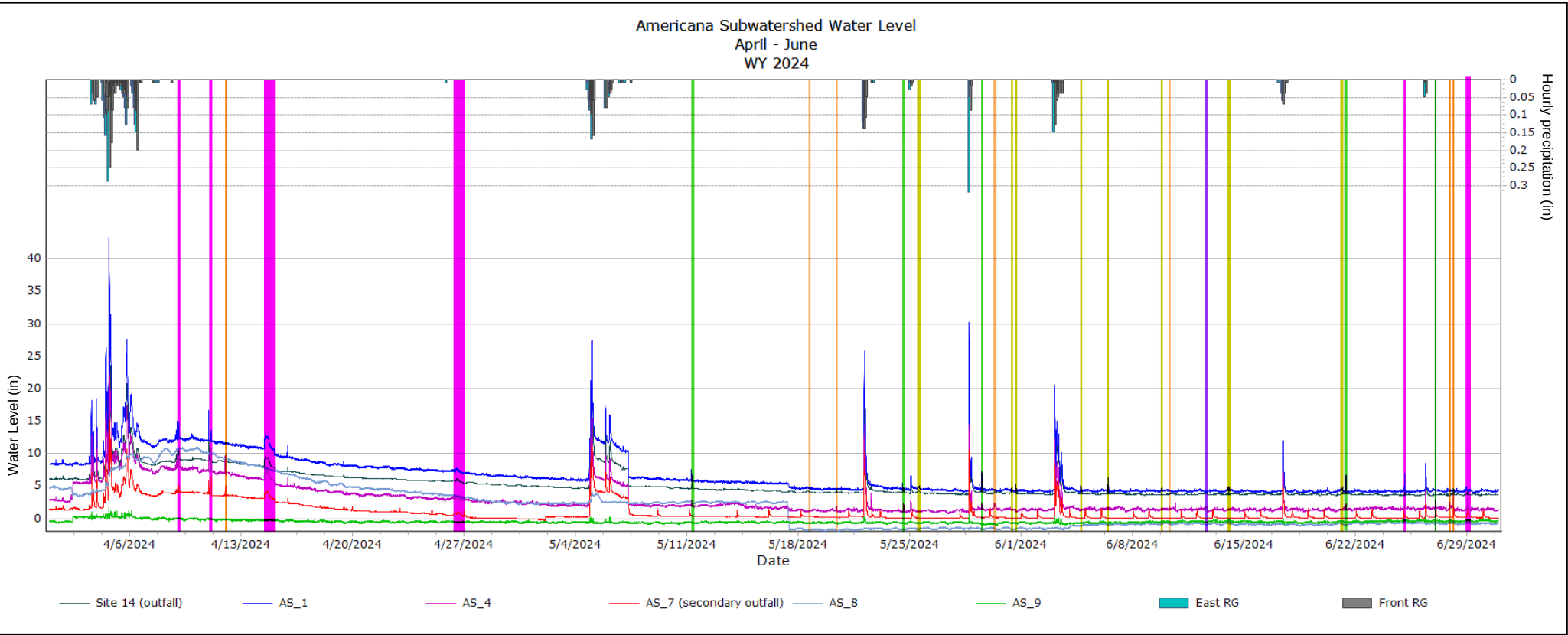
Americana Subwatershed Review WY24 Q2
Figure 4.



Americana Subwatershed Review WY24 Q2

Color Code	Beginning Date Time	Duration (hrs)	Sites Included	Non-stormwater source
	1/3/2024 9:00:00	5.0	AS_4	AS_4 Subcatchment
	1/4/2024 8:00:00	4.5	AS_4	AS_4 Subcatchment
	1/4/2024 12:30:00	5.0	AS_4, AS_7	AS_4 Subcatchment
	1/6/2024 22:00:00	5.0	AS_1, AS_4, AS_9, Site 14	AS_1 Subcatchment
	1/14/2024 13:00:00	7.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	1/21/2024 11:00:00	9.5	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	1/23/2024 13:00:00	4.5	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	2/8/2024 1:00:00	129.5	AS_8 (elongated)	Hull's Gulch
	2/20/2024 18:30:00	44.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	2/26/2024 18:00:00	47.5	AS_8	AS_8 Subcatchment
	3/8/2024 6:00:00	10.5	AS_4, AS_7	AS_4 Subcatchment
	3/11/2024 7:30:00	9.0	AS_4, AS_7	AS_4 Subcatchment
	3/13/2024 7:30:00	9.0	AS_4	AS_4 Subcatchment
	3/14/2024 7:30:00	7.0	AS_4	AS_4 Subcatchment
	3/19/2024 11:30:00	2.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	3/22/2024 5:30:00	3.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	3/25/2024 1:30:00	14.0	AS_4	AS_4 Subcatchment
	3/26/2024 4:30:00	13.0	AS_4	AS_4 Subcatchment
	3/27/2024 5:00:00	10.5	AS_4	AS_4 Subcatchment
	3/29/2024 5:00:00	10.5	AS_4	AS_4 Subcatchment

Americana Subwatershed Review WY24 Q3
Figure 5.

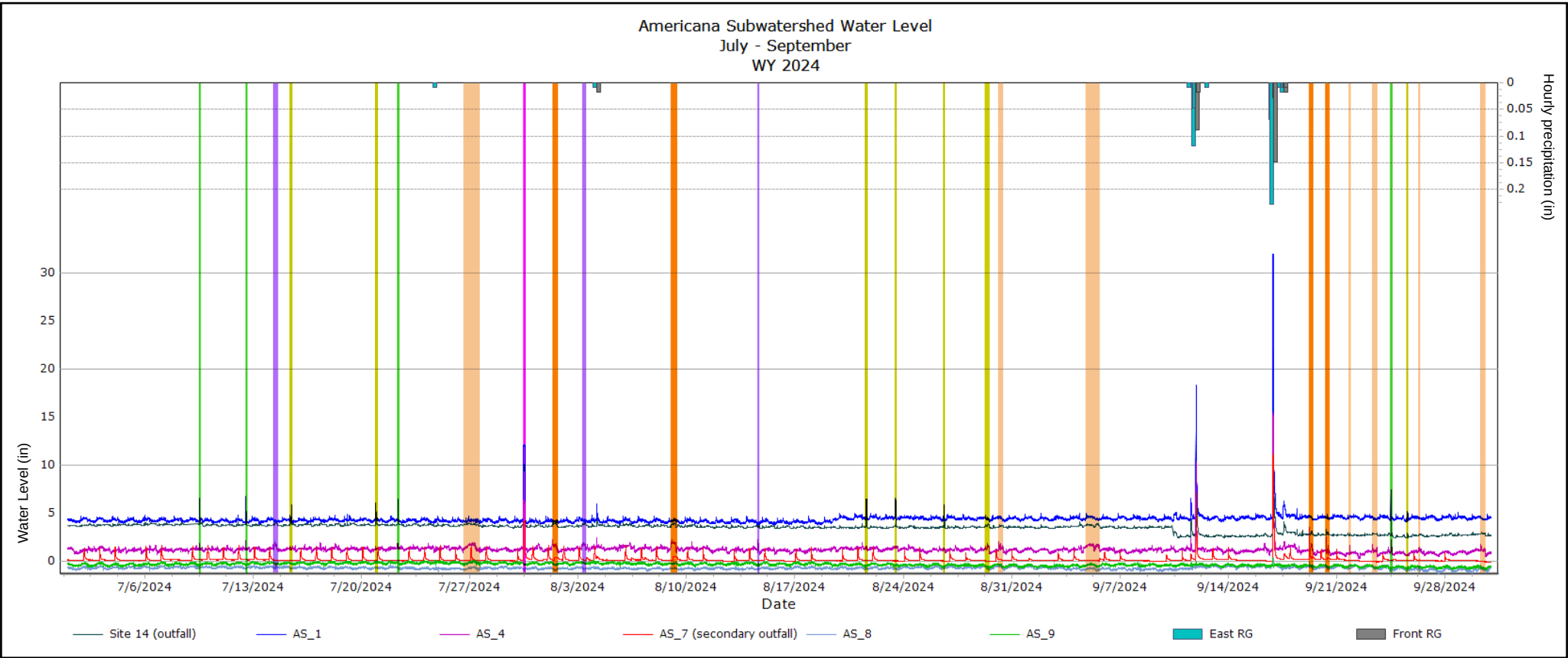


Note: Reoccurring water level spikes were observed at the AS_7 station. These spikes occur for an approximate duration of 4 hours between 2330 and 0900. The spikes have been omitted from this anomaly summary due to the uniformity of the spikes and similarity to spikes observed during WY 2023.

Americana Subwatershed Review WY24 Q3

Color Code	Beginning Date Time	Duration (hrs)	Sites Included	Non-stormwater source
	4/8/2024 22:00:00	6.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	4/10/2024 23:00:00	5.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	4/12/2024 0:30:00	2.0	AS_4, AS_7, Site 14	AS_4 Subcatchment
	4/14/2024 11:00:00	17.5	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	4/26/2024 7:00:00	19.5	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	5/11/2024 7:00:00	2.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	5/20/2024 9:00:00	3.0	AS_4	AS_4 Subcatchment
	5/24/2024 14:00:00	3.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	5/25/2024 13:00:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	5/29/2024 12:30:00	2.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	5/30/2024 7:00:00	5.0	AS_4	AS_4 Subcatchment
	5/31/2024 9:30:00	2.0	AS_1, Site 14	AS_1 Subcatchment
	5/31/2024 16:00:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	6/4/2024 18:00:00	2.5	AS_1, Site 14	AS_1 Subcatchment
	6/6/2024 10:30:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	6/9/2024 19:00:00	3.0	AS_1, Site 14	AS_1 Subcatchment
	6/10/2024 7:00:00	2.5	AS_4	AS_4 Subcatchment
	6/10/2024 16:00:00	2.5	AS_4	AS_4 Subcatchment
	6/12/2024 14:00:00	4.0	AS_4, Site 14	AS_4 Subcatchment
	6/13/2024 23:30:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	6/21/2024 1:00:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	6/21/2024 7:30:00	4.5	AS_1, AS_4, Site 14	AS_1 Subcatchment
	6/25/2024 0:30:00	3.5	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	6/27/2024 0:00:00	4.0	AS_4, AS_7	AS_4 Subcatchment
	6/27/2024 23:00:00	3.5	AS_4, AS_7, Site 14	AS_4 Subcatchment
	6/28/2024 4:00:00	2.5	AS_4, AS_7, Site 14	AS_4 Subcatchment
	6/29/2024 0:00:00	7.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment

Americana Subwatershed Review WY24 Q4
Figure 6.



Note: Reoccurring water level spikes were observed at the AS_7 station. These spikes occur for an approximate duration of 4 hours between 2330 and 0900. The spikes have been omitted from this anomaly summary due to the uniformity of the spikes and similarity to spikes observed during WY 2023.

Americana Subwatershed Review WY24 Q4

Color Code	Beginning Date Time	Duration (hrs)	Sites Included	Non-stormwater source
	7/9/2024 11:00:00	3.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	7/12/2024 12:00:00	2.0	AS_1, AS_4, Site 14	AS_1 Subcatchment
	7/14/2024 7:00:00	8.0	AS_4, Site 14	AS_4 Subcatchment
	7/15/2024 8:30:00	4.5	AS_1, Site 14	AS_1 Subcatchment
	7/20/2024 21:00:00	2.5	AS_1, Site 14	AS_1 Subcatchment
	7/22/2024 7:00:00	2.5	AS_1, AS_4, Site 14	AS_1 Subcatchment
	7/26/2024 13:00:00	28.5	AS_4	AS_4 Subcatchment
	7/30/2024 10:30:00	4.0	AS_1, AS_4, AS_7, Site 14	AS_1 Subcatchment
	8/1/2024 6:30:00	10.5	AS_4, AS_7, Site 14	AS_4 Subcatchment
	8/3/2024 5:30:00	6.5	AS_4, Site 14	AS_4 Subcatchment
	8/8/2024 21:30:00	12.5	AS_4, AS_7, Site 14	AS_4 Subcatchment
	8/14/2024 13:30:00	3.5	AS_4, Site 14	AS_4 Subcatchment
	8/21/2024 13:30:00	3.5	AS_1, Site 14	AS_1 Subcatchment
	8/23/2024 11:00:00	2.5	AS_1, Site 14	AS_1 Subcatchment
	8/26/2024 13:30:00	4.0	AS_1, Site 14	AS_1 Subcatchment
	8/29/2024 7:00:00	7.5	AS_4, Site 14	AS_4 Subcatchment
	8/30/2024 4:30:00	9.0	AS_4	AS_4 Subcatchment
	9/4/2024 19:30:00	22.0	AS_4	AS_4 Subcatchment
	9/19/2024 5:30:00	8.0	AS_4, AS_7, Site 14	AS_4 Subcatchment
	9/20/2024 7:30:00	6.0	AS_4, AS_7, Site 14	AS_4 Subcatchment
	9/21/2024 19:30:00	3.0	AS_4	AS_4 Subcatchment
	9/23/2024 7:30:00	8.5	AS_4	AS_4 Subcatchment
	9/24/2024 9:00:00	6.5	AS_1, AS_4, Site 14	AS_1 Subcatchment
	9/25/2024 12:00:00	5.5	AS_1, Site 14	AS_1 Subcatchment
	9/26/2024 7:00:00	5.5	AS_4	AS_4 Subcatchment
	9/30/2024 7:00:00	8.0	AS_4	AS_4 Subcatchment

Figure 7. Percent Contribution 11/19/2023

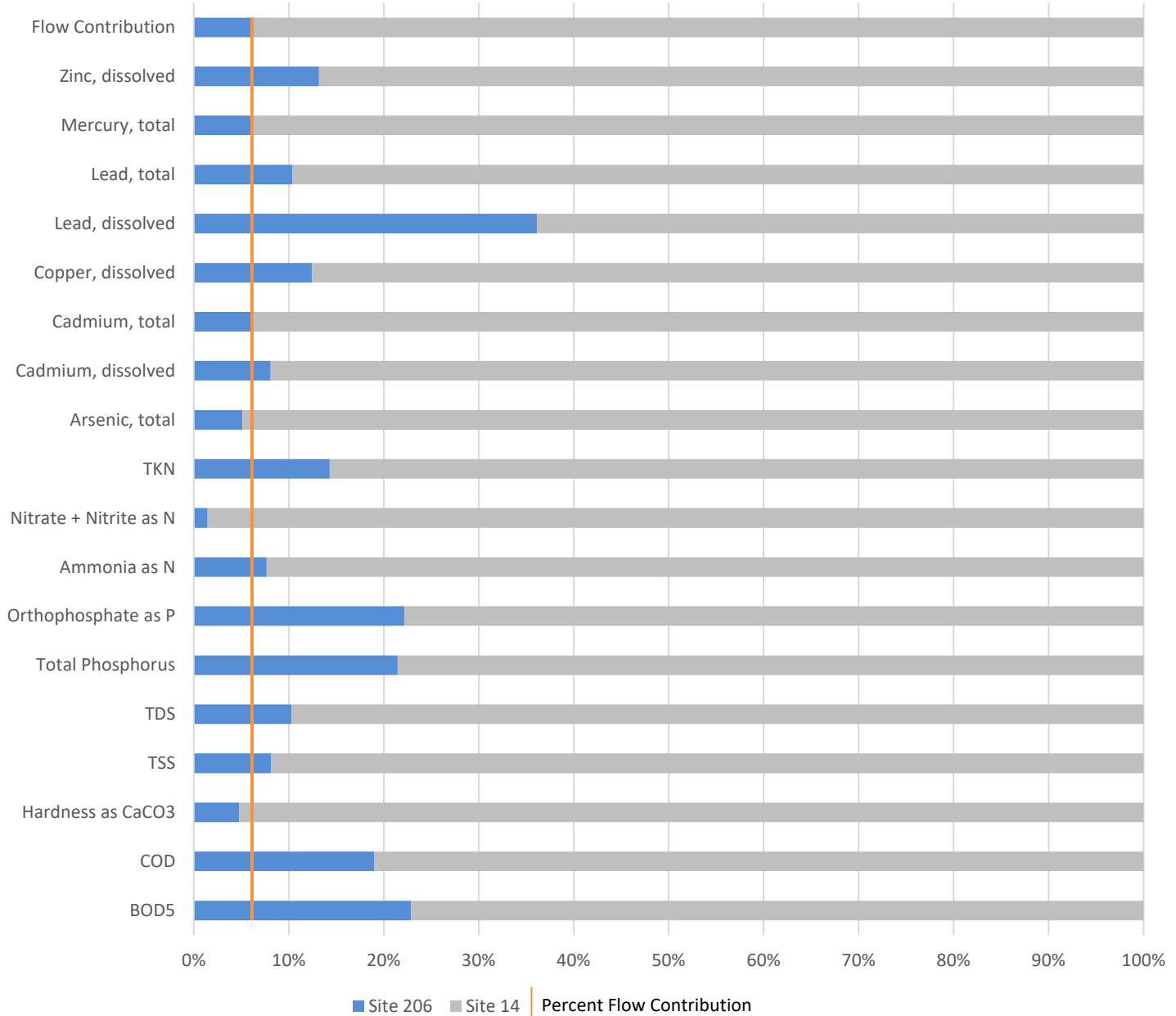


Figure 8. Percent Contribution 2/1/2024

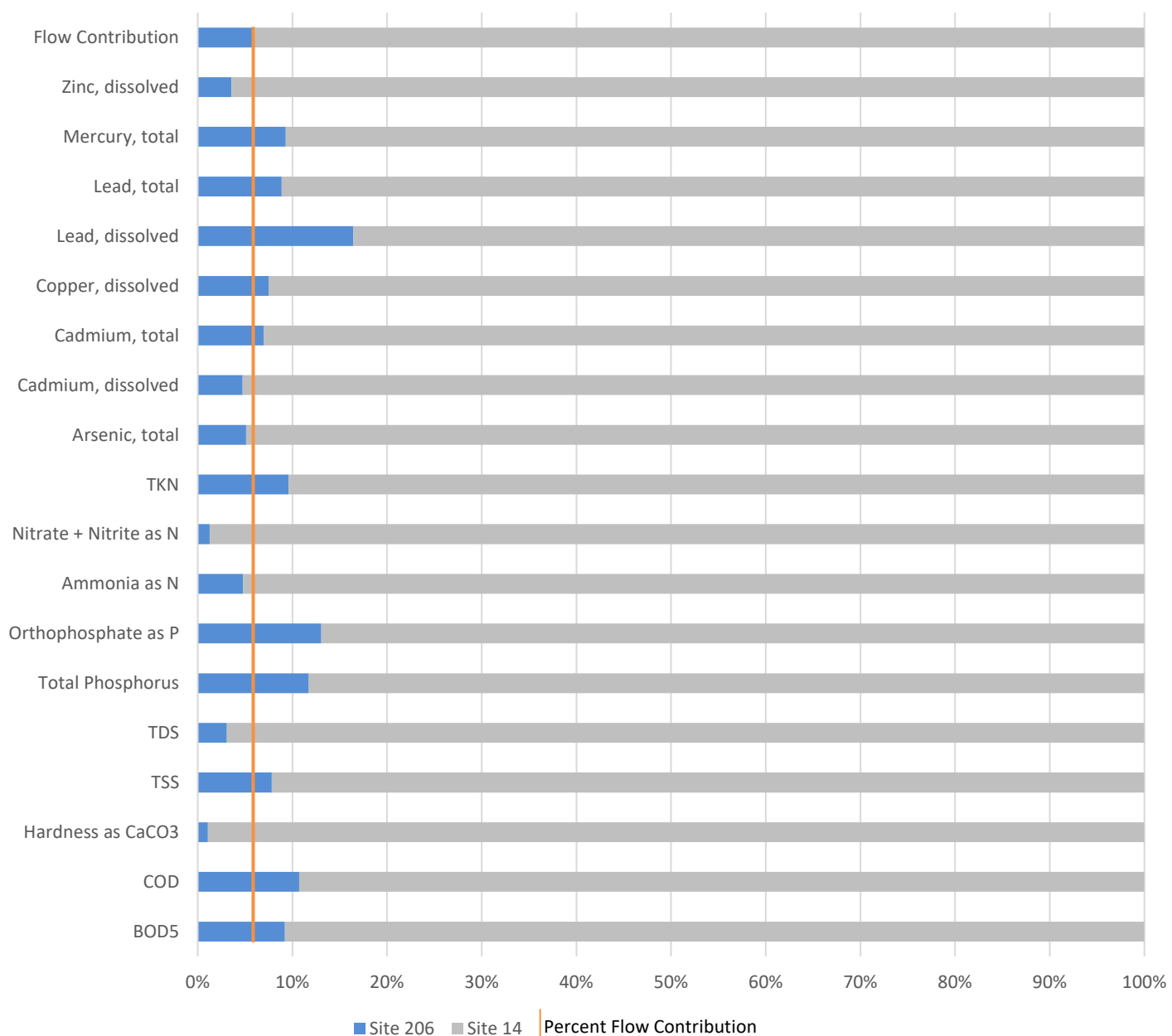
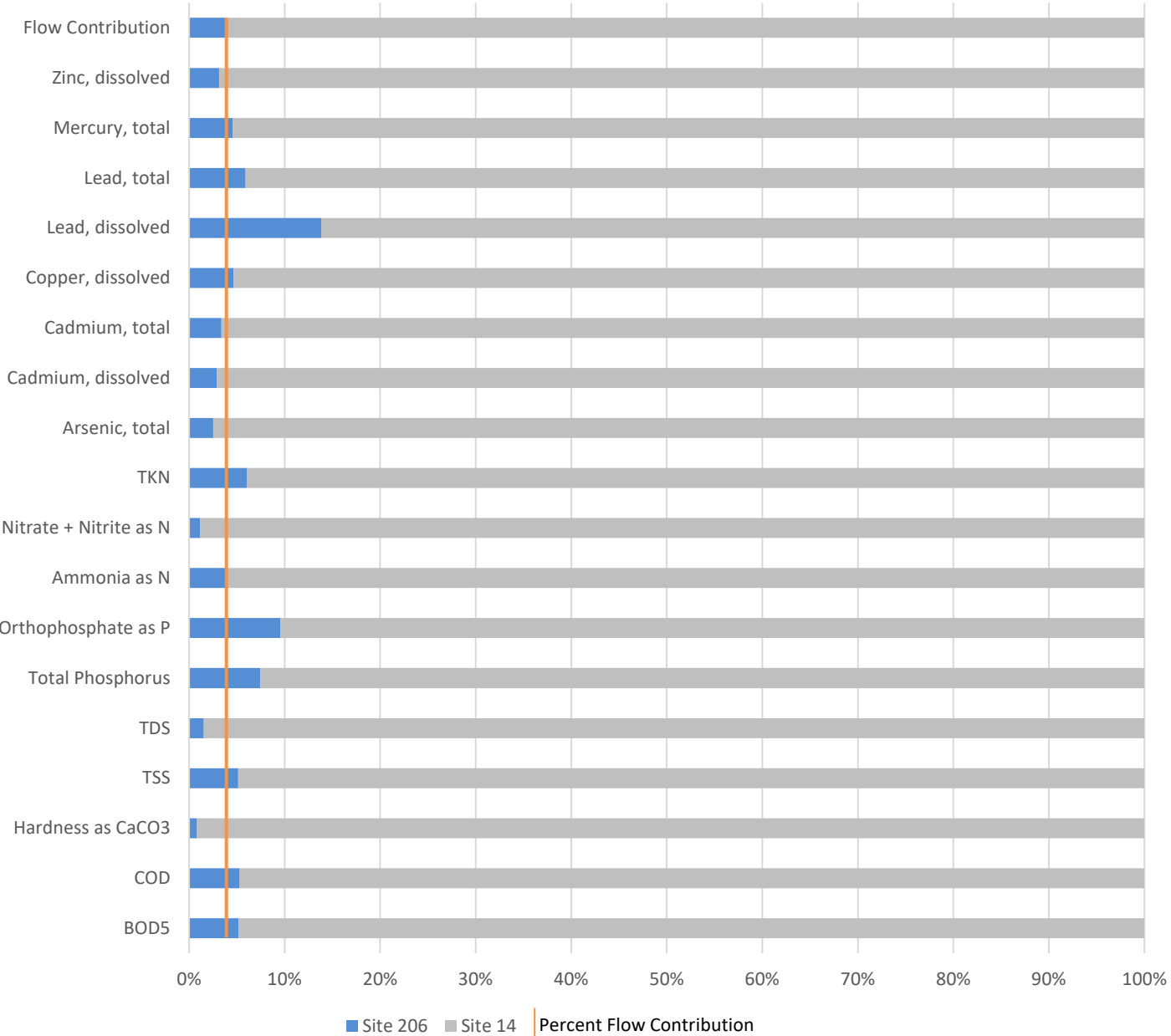


Figure 9. Percent Contribution 2/26/2024



Appendix 9

Temperature Monitoring Summary WY 2024

Temperature Monitoring Summary WY 2024

Ada County Highway District

11/13/2024

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1. Introduction

Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Permittees) were issued a National Pollutant Discharge Elimination System Phase I Permit #IDS027561 (Permit) on October 1, 2021. The Permit authorizes the Permittees to discharge from municipal separate storm sewer (MS4) outfalls to the Boise River and its tributaries. According to Permit Part 4.1, *Temperature Monitoring*, Permittees must monitor temperature in stormwater discharges from the MS4 to the Boise River including assessment units 17050114SW005_06, 17050114SW005_06a, and 17050114SW005_06b. The Boise River assessment units (AU) within the Permit area are 17050114SW011a_06 and 17050114SW005_06. The remaining two AUs, 17050114SW005_06a and 17050114SW005_06b are not in the Permit area and therefore do not receive Permittee stormwater contributions. Temperature data is collected from all water quality samples collected from the MS4 to the Boise River and other waterways. The following summary provides temperature data collected during water year (WY) 2024 (October 1, 2023 – September 20, 2024) from the MS4 directly to the Boise River assessment units 17050114SW011a_06 and 17050114SW005_06.

2. Monitoring Sites, Equipment, and Sample Type

Temperature monitoring occurred at 12 outfalls that discharge to the Boise River assessment units 17050114SW011a_06 and 17050114SW005_06. Temperature measurements are collected as either discrete or continuous. Discrete measurements represent one instance in time and were measured manually using an In-Situ aqua Troll or smarTroll handheld instrument. Continuous measurements were taken at a specified interval by equipment that is installed at the outfall site. In WY 2024, continuous temperature readings were taken at four outfall locations: three using area-velocity sensors and one using a Hobo Temperature Logger. Table 2-1 below shows the number of outfalls where temperature data was collected, the outfall ID, sample type, receiving water and assessment unit designation. Figure 1 is a map of the sampled outfall locations.

Table 2-1. Temperature Monitored Outfalls				
Receiving Water	Assessment Unit	# of Temperature Monitored Outfalls	Outfall ID (Station Name)	Sample Type
Boise River	17050114SW011a_06	10	3n2e04_010 (Main)	Discrete and Continuous
			3n2e09_024 (Americana)	Discrete and Continuous
			3n2e09_025 (AS_7)	Continuous
			3n2e10_012	Discrete
			3n2e10_022	Discrete
			3n2e10_031	Discrete
			3n2e14_012	Discrete
			3n2e14_013	Discrete
			3n2e14_017	Discrete
			3n2e24_025	Discrete
	17050114SW005_06	2	4n2e30_012 (Plantation)	Continuous
			4n2e32_015	Discrete

3. Results

Discrete temperature results are depicted in Figure 2. These results were derived from both wet weather and dry weather discharges, which are symbolized by a circle or a star, respectively. Table 3-1 contains all discrete measurements by outfall site.

Graphs of continuous temperature results are found in Figures 3-6. Figure 4 depicts continuous temperature collected only during selected storm events. The graphs from sites where temperature is recorded using an area-velocity sensor (Figures 3-5) display water temperature, water level and hourly precipitation for reference. Temperature at the Plantation site is recorded using a Hobo Temperature Logger that records data associated with the presence of water. Notable observations from these graphs are discussed below.

Throughout the summer months, AS_7 (Figure 5), is generally characterized by no dry weather flow except for almost daily level spikes recorded during early morning hours. According to the sensor manufacturer, accuracy of the area velocity sensor decreases at water levels below one inch. Therefore, it is difficult to discern the accuracy of the low flow data and distinguish between air and water temperature under these conditions. Therefore, all recorded temperature data from AS_7 has been included in the graph shown in Figure 5.

Data gaps in the temperature data shown in Figure 6, Plantation (4n2e30_012), indicate water was not present or the data was rejected due to sediment interference. Unlike the other graphs of continuous temperature results, water level data is not available at this monitoring site. Sediment was observed on the temperature logger in October 2023 during routine data downloads. The presence of sediment yielded results that water was present when it was observed the site was dry. During WY24, ACHD increased inspection frequency of the logger, noting changes in site conditions when present. The storm drain system was cleaned in February 2024 and inspected bimonthly for sediment build up throughout the water year. Sediment on the logger was observed again from the end of September 2024 through the beginning of November 2024, indicating more frequent maintenance is required. Additionally, data from WY23 showed water was present, based on the recorded temperature data, when rainfall was not recorded. Visual observations during WY24 of the watershed indicate sprinkler runoff as a source of this flow. From mid-May through the end of September, daily intermittent water temperature readings were recorded. Due to the daily occurrences of these readings, temperature in Figure 6 appears to be continuous despite being intermittent throughout each day.

Table 3-1. Discrete Temperature Results			
Outfall ID (Station Name)	Date	Weather	Temperature (C)
3n2e04_010 (Main)	11/19/2023	Wet Weather	10.54
	2/1/2024		6.3
	2/26/2024		9.53
	3/28/2024		10.91
3n2e09_024 (Americana)	12/14/2023 8/1/2024	Dry Weather	14.31 20.82
3n2e09_024 (Americana)	10/10/2023	Wet Weather	16.78
	11/19/2023		14.16
	2/1/2024		8.34
	2/26/2024 3/28/2024		8.74 9.79
3n2e10_012	2/14/2024 8/5/2024	Dry Weather	8.76 15.94
3n2e10_022	3/15/2024 7/9/2024	Dry Weather	14 18.36
3n2e10_031	6/24/2024	Dry Weather	15.04
3n2e14_012	1/31/2024	Dry Weather	15.04
3n2e14_013	1/31/2024	Dry Weather	14.62
	8/13/2024		16.12
3n2e14_017	12/17/2023	Dry Weather	15.33
	1/3/2024		13.54
3n2e24_025	5/22/2023	Dry Weather	16.15
4n2e32_015	8/1/2023	Dry Weather	17.85

Appendix A: Figures

Figure 1. Overview Map

Figure 2. Discrete Temperature Results

Figure 3. Continuous Temperature Results – Main

Figure 4. Continuous Temperature Results – Americana

Figure 5. Continuous Temperature Results – AS_7

Figure 6. Continuous Temperature Results – Plantation

Figure 1

WY2024 Temperature Monitored Outfalls

Created: 11/19/2024



Figure 2

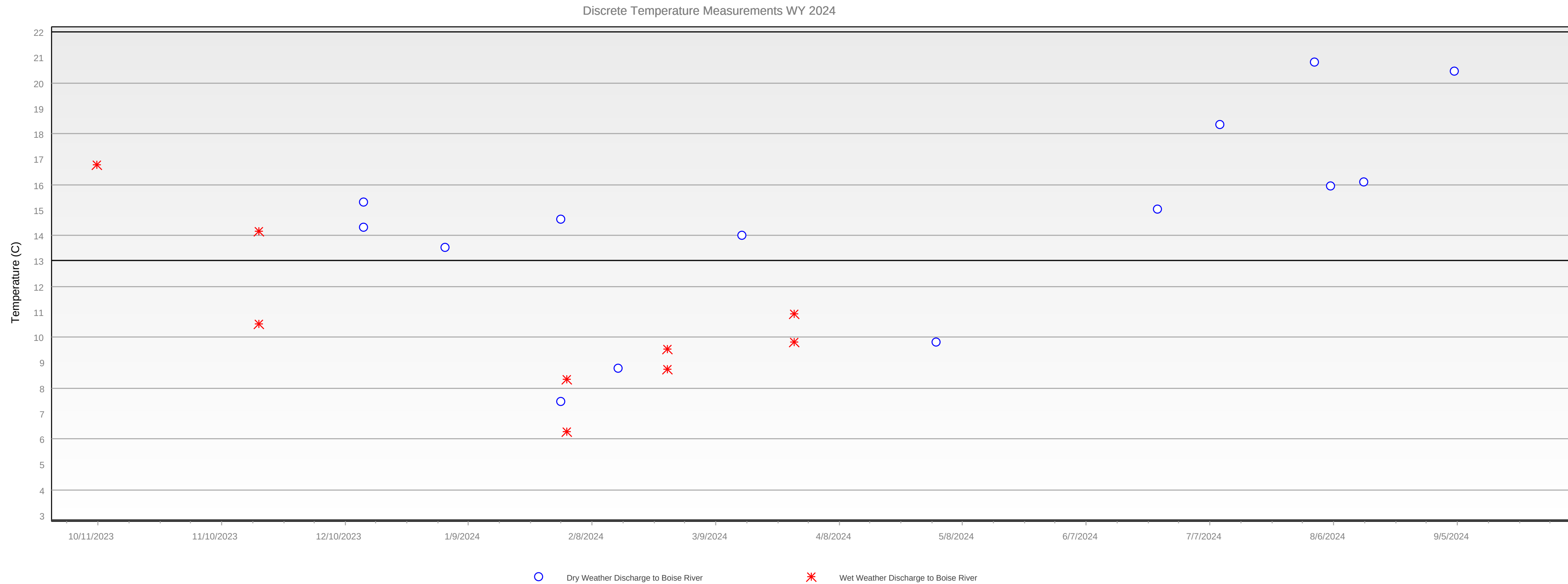


Figure 3

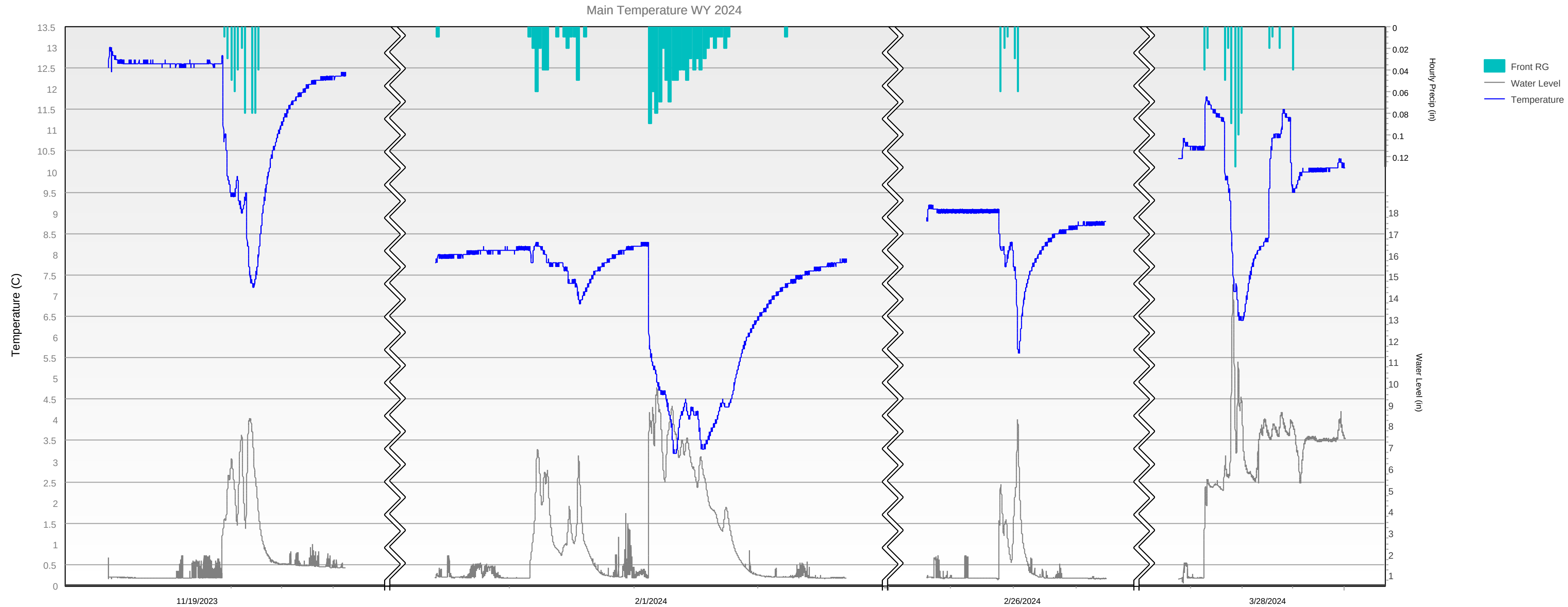


Figure 4

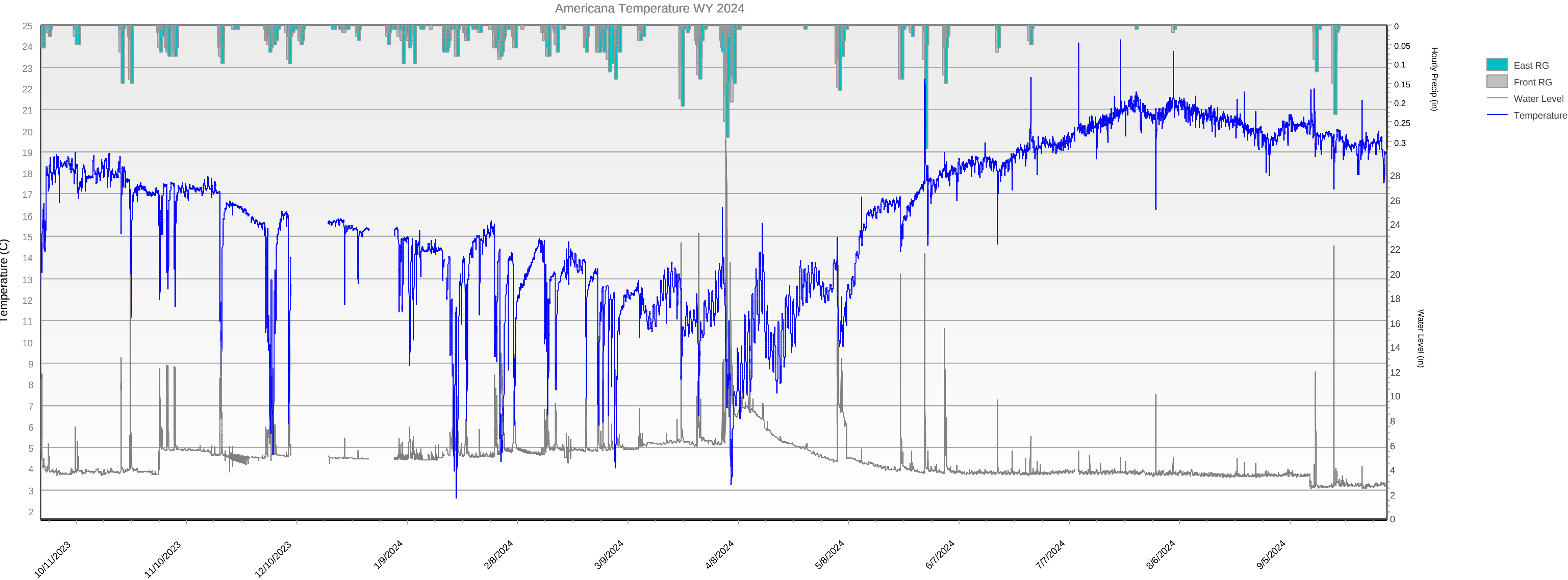


Figure 5

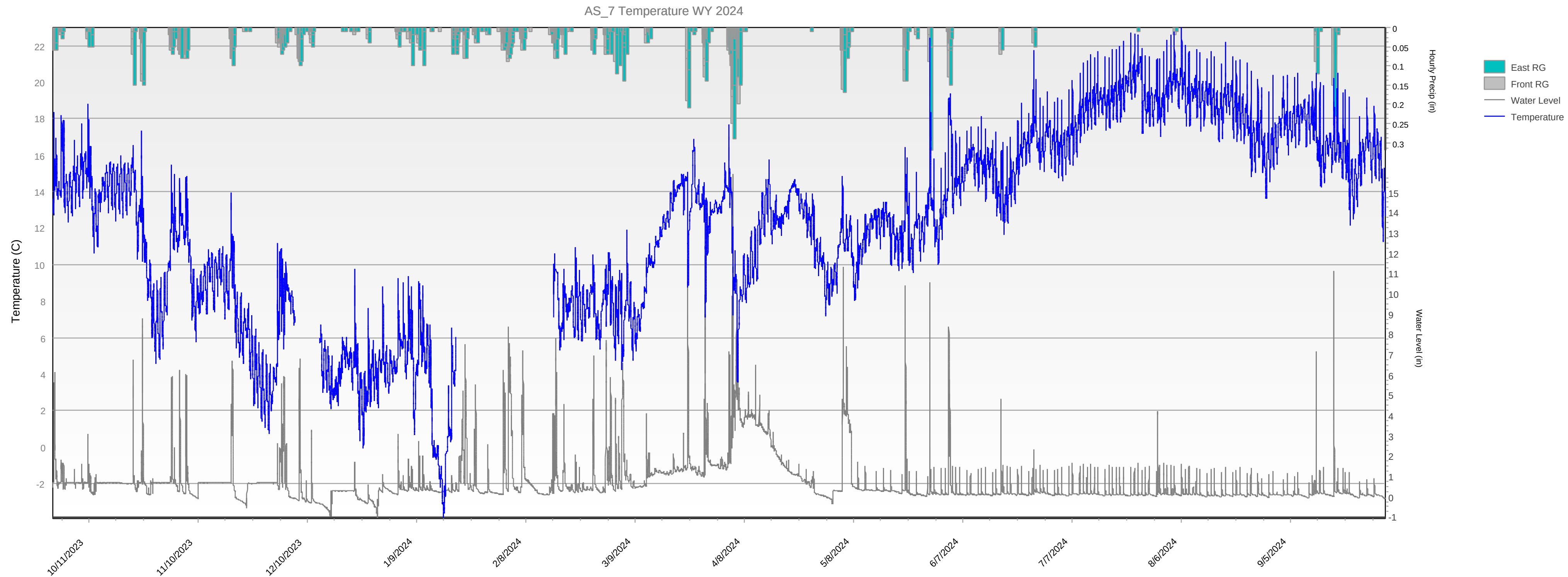
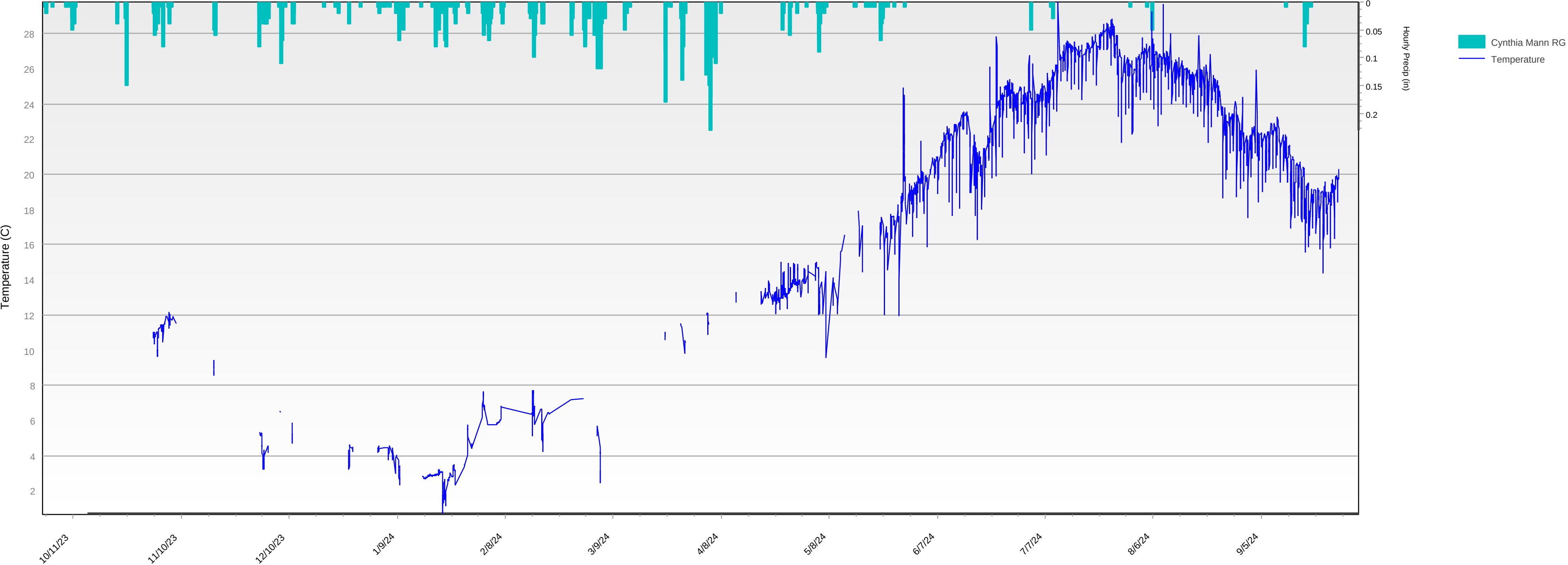


Figure 6

Plantation (4n2e30_012) WY 2024



Appendix 10

Phase 1 MS4 Permit Annual Report Responses

Completed January 17, 2025

By Jennifer Ellis

NPDES Permit #IDS027561

Permit Appendix B – Annual Report Form

Section II. Permittee Responsibility

1. This Permittee organization shares implementation responsibility for Permit Compliance with one or more Permittees. **Yes.** [Is the agreement between the Permittees described/cited in the Stormwater Management Program \(SWMP\) document? Yes. The Amended and Restated Intergovernmental Agreement for Roles and Responsibilities Under the NPDES Permit #IDS027561 and Operating Guidelines were updated in September 2022 and executed in December 2022. These documents are available in Boise State University's SWMP, Appendix B.](#)
2. The Permittee organization shares implementation responsibility for Permit compliance with one or more outside (non-Permittee) entities. **No.** [Boise State works cooperatively with other State and local entities as described in the "Boise State University Stormwater Management Program \(SWMP\) Section 1.2 Applicability", but does not share implementation responsibilities with non-permittee entities.](#)
3. This Permittee organization maintains relevant ordinances or other regulatory mechanisms to control pollutant discharges into and from the MS4 to meet the requirements of the permit. **Yes.** [Authority is delegated by Boise State University policy 9140. It established the scope and nature of the University's responsibility commitment to provide a safe and healthy environment for the University community. Additionally, discharge regulations and requirements are covered by Boise City Code 10-6-2.](#)
4. The Permittee organization's SWMP Document is posted on a publicly accessible website. **Yes.** **Identify the URL for the webpage where the SWMP Document can be accessed:** <http://partnersforcleanwater.org/aboutpartners/boise-state>
5. The Permittee organization provided a summary of total costs associated with SWMP implementation over the reporting period. **Yes.**

Boise State University Storm Water Budget	Actual WY2024	Estimate WY2025
	10/1/2023 - 9/30/2024	10/1/2024 - 9/30/2025
Public Education and Outreach Cost Share, Stormwater Partners for Clean Water, City of Boise	\$1,549.54	\$3,237.00
NPDES Monitoring Cost Share, Ada County Highway District	\$13,946.40	\$15,658.50
Total	\$15,495.94	\$18,895.50

6. This Permittee organization regularly tracks certain activities to set priorities and assess compliance with the Permit requirements. **Yes.** In addition to annual reporting, Boise State University tracks related activities to set priorities and assess compliance through regular meetings with co-permittees. Furthermore, ACHD's involvement with Boise State University pertaining to Permit #IDS027561 is described in the Boise State University SWMP – 2024 document (Appendix 1 of this annual report.)
7. During the reporting period, responsibility for SWMP implementation has changed due to a Transfer of Ownership or Operational Authority over a geographic portion of the MS4. **Not applicable.** Responsibility for SWMP implementation has not changed, nor has it changed due to a Transfer of Ownership or Operational Authority over a geographic portion of MS4.

Section III. Status of SWMP Control Measures

Public Education, Outreach and Involvement Program (Permit Part 3.1)

The following statement applies to Q/A #8 - #15: The City of Boise is the lead Permittee responsible for implementing the education, outreach and involvement activities required by the Permit throughout the Phase I permit area, according to the Intergovernmental Agreement and Operating Guidelines provided in the Boise State University SWMP – 2024 (Appendix 1 of this annual report.) A comprehensive summary of education, outreach and involvement activities is available in Appendix 6 of this annual report.

8. This Permittee organization conducts an education, outreach, and public involvement program based on stormwater issues of significance in the Permittee's jurisdiction. **Yes, this organization works through contract with other entities to conduct the education, outreach, and involvement activities required by the Permit.**
9. Target Audience: During the reporting period, this Permittee organization focused its education, outreach and public involvement messages to the following audience(s): **General Public, Business/Industrial/Commercial/Institutions, Construction/Development, Elected Officials, Land Use Policy and Planning Staff.**
10. Topics: During the reporting period, this Permittee organization focused its education, outreach and public involvement messages on the following topics: **General impacts of stormwater flows into surface water, and appropriate action to prevent adverse impacts; Impacts from impervious surfaces, techniques to avoid adverse impacts; Yard care techniques protective of water quality, such as composting; Proper use, application & storage of pesticides, herbicides, and fertilizers; Litter and trash control and recycling programs; BMPs for power washing, carpet cleaning, auto repair and maintenance; Low impact Development/green infrastructure techniques, including site design, pervious paving, retention of mature trees/vegetation, landscaping and vegetative buffers; Maintenance of landscape features providing water quality benefits; Stormwater treatment and volume control practices;**

Technical standards for stormwater site plans; including appropriate selection, installation and use of required construction site control measures; Source control BMPs and environmental stewardship; Impacts of illicit discharges and how to report them; Actions and opportunities for pet waste control/disposal; Water wise landscaping, water conservation, water efficiency; BMPs for use and storage of automotive chemicals, hazardous cleaning supplies, vehicle wash soaps, and other hazardous materials;

11. During the reporting period, this Permittee organization began and/or continued distribution of the selected messages/activities to the intended target audience. **Yes.**
12. During this reporting period, the Permittee organization assessed, or participated in efforts to assess, the understanding and adoption of intended behaviors by the target audience. **Yes.**
13. During this reporting period, this Permittee organization offered (or worked with others to offer) training /education regarding construction site runoff control measure to site operators working in the Permittee's jurisdiction. **Yes.**
14. During this reporting, this Permittee organization offered (or worked with others to offer) training/education regarding permanent stormwater controls to audiences working in the Permittee's jurisdiction. **Yes.**
15. This Permittee organization maintains and promotes a publicly-assessible website that provides current SWMP-related information cited in Permit Part 3.1.8. This website was recently updated prior to submitting this Report. **Yes.** <http://partnersforcleanwater.org>

Illicit Discharge Detection and Elimination Program (Permit Part 3.2)

16. To the extent allowable pursuant to authority granted under Idaho law, this Permittee organization conducts and enforces a program to detect and eliminate illicit discharges into the MS4. **Yes.** [Boise State University conducts and enforces multiple programs which result in the detection and elimination of illicit discharges in the MS4 including complaint response activities, regular outfall inspections, and the Spill Prevention Control and Countermeasure \(SPCC\) plan. Boise State University will continue to refine and formalize this program.](#)
17. This Permittee organization maintains a current MS4 Map and Outfall Inventory as described in Permit 3.2.2. **Yes.** [A current MS4 map and outfall inventory are included in the Boise State University SWMP – 2024 \(Appendix 1 of this annual report.\)](#)
18. To the extent allowable pursuant to authority granted under law, this Permittee organization prohibits non-storm water discharges into the MS4 (except those identified in Permit Part 2.4) through an ordinance or other regulatory mechanism. **Yes.** <https://boisestate.edu/policy/facilities-planning-campus-safety/policy-title-environmental-health-and-safety/> Authority is delegated by Boise State University policy 9140. It establishes the scope and nature of the University's responsibility and

commitment to provide a safe and healthy environment for the University community. Additionally, discharge regulations and requirements are covered by Boise City Code 10-6-2.

19. The Permittee organization maintains a dedicated telephone number, email address, and/or other means for the public to report illicit discharges, **Yes. Stormwater Pollution Prevention Hotline: 208-395-8888**
20. This Permittee organization responds and investigates illicit discharge complaints or reports within two working days. **Yes.**
21. Number of Public Complaints/Report Received During this Reporting Period: **0**
22. Number of Illicit Discharge Complaints/Reports Investigated through field visits, sampling or other follow-up action. **0**
23. Number of Illicit Discharge Complaints/Reports Resolved. **0**
24. This Permittee organization conducts a dry weather analytical and field screening monitoring program to identify non-stormwater flows from MS4 outfalls. **Yes. Dry weather analytical and field screening monitoring program is implemented by ACHD on behalf of Boise State University using ACHD's dry weather screening plan in accordance with the intergovernmental agreement in the Boise State University SWMP – 2024 Appendix B (this document is in Appendix 1 of this annual report.)**
25. During this reporting period, this Permittee organization used its written protocols to prioritize and identify MS4 outfalls for dry weather discharge investigation. **Yes. All 16 of Boise State University's MS4 outfalls were investigated for dry weather discharge and sampled when applicable.**
26. Total Number of MS4 Outfalls in the Permittee's jurisdiction of the Permit Area: **16**
27. During the reporting period, this Permittee organization completed visual dry weather screening on at least 20% of MS4 outfalls. **Yes. See Appendix 2 of this annual report document (Dry Weather Outfall Inspection and Sampling Summary)**
28. Of the 20% of MS4 outfalls screened during the reporting period: How many outfalls were discharging during dry weather? **7**, How many of these identified dry weather discharges were sampled or otherwise investigated to determine the discharge source? **5**, How many of the identified dry weather discharges resulted in the Permittee action to address and eliminate the discharge source? **0** See Appendix 2 of this annual report document. "Dry Weather Outfall Inspection and Sampling Summary "
29. During this reporting period, how many of the Permittee's MS4 outfalls have been identified as having dry weather flows caused by irrigation return flow or ground water seepage? Number of outfalls identified this reporting period. **16** Total Number of MS4 outfalls identified to date, as having dry weather flows from irrigation or groundwater seepage. **1**. **The source of dry weather flow for Outfall "Yanke West", was determined to be from a sprinkler leak.**
30. This Permittee organization maintains written spill responses procedures and coordinates appropriate spill prevention, containment and response activities with other organizations

in the Permit Area to ensure maximum water quality protection at all times. **Yes.** [Boise State University maintains a Spill Prevention, Control, and Countermeasure \(SPCC\) plan.](#)

31. This Permittee organization coordinates with appropriate local entities to educate employees and the public of the proper management and disposal or recycling of used oil, vehicle fluids, toxic materials, and other household hazardous wastes. **Yes.** [The City of Boise is the lead Permittee responsible for implementing the education, outreach and involvement activities required by the Permit. Educational materials on rules, pick-up schedule, and other information on proper disposal of household hazardous waste are made available to the public by the City of Boise at \[www.cityofboise.org/departments/public-works/curb-it/hhw/\]\(http://www.cityofboise.org/departments/public-works/curb-it/hhw/\). Boise State University's Environmental Health and Safety Department in conjunction with appropriate local entities ensures appropriate education and training for employees responsible for disposal or recycling of hazardous waste.](#)
32. This Permittee organization's staff responsible for investigating, identifying and eliminating illicit discharges, spills, and illicit connections into the MS4 are trained to conduct such activities. **Yes.**
33. This Permittee organization's staff responsible for investigating, identifying and eliminating illicit discharges, spills, and illicit connections into the MS4 are trained to conduct such activities. **Yes.** [See "Boise State University SWMP – 2024 Section 3.1" \(this document is located in Appendix 1 of this annual report document\) Projects which occur on state land and are greater than or equal to one acre are operated by the Idaho Division of Pubic Works.](#)
34. This Permittee organization requires construction site operators to submit construction site plans for Permittee review. **Yes.** [Boise State University defers to the respective agency with appropriate jurisdictional authority for final approval of construction site plans.](#)
35. This Permittee organization inspects construction sites to ensure compliance with applicable requirements for erosion, sediment and waste material management controls. **Yes.** [Construction sites are monitored for issues and/or deficiencies related to erosion and sediment control. Issues are reported to the Boise State Project Manager for resolution.](#)
36. This Permittee organization inspects construction sites using an inspection prioritization system. **Yes.** [Construction sites are monitored for issues and/or deficiencies related to erosion and sediment control. Issues are reported to the Boise State Project Manager for resolution.](#)
37. This Permittee organization implements a written escalating enforcement response policy or plan (ERP) for construction site runoff control. **Yes.** [Boise State University does not have a written or formal ERP for construction site runoff control. However, Idaho Department of Public Works \(DPW\) is responsible for contracting design and construction services for public works projects across state-owned facilities, including those at BSU. They manage the bidding process, select contractors, and oversee project](#)

execution to ensure compliance with state laws and efficient use of resources. Once a contractor is selected, DPW oversees the construction process, ensuring adherence to state regulations and project specifications. The selected contractors do have an ERP.

38. This Permittee organization ensures that all persons responsible for preconstruction site plan review, site inspections, and enforcement of construction site runoff control requirements are appropriately trained to conduct such activities – specifically, this organization provides orientation and training for new staff working on construction runoff control issues within the first six (6) months of employment. **Yes.** People responsible for ESC and SWPPP requirements attend training provided by a qualified third-party agency.
39. Through ordinance or other regulatory mechanism, this Permittee organization requires the installation and long-term maintenance of permanent stormwater controls at new development and redevelopment project sites that result from land disturbance of 5,000 square feet or more, excluding individual one- or two-family dwelling development or redevelopment and the infill or redevelopment of public pedestrian infrastructure projects. Required controls are sufficient to retain onsite the runoff volume produced from the first 0.6 inches of rainfall from a 24-hour event preceded by 48 hours of no measurable precipitation, and/or require runoff treatment providing equal or greater level of water quality benefit as this onsite retention standard. **Yes. Boise City Code 10-6-3.**
40. This Permittee organization requires permanent storm water controls through written specifications. **Yes.**
<https://www.achdidaho.org/home/showpublisheddocument/462/638243231741230000>
41. This Permittee organization requires preconstruction site plan review and approval for permanent storm water controls at new development and redevelopment sites. **Yes.** 41.b. This Permittee organization cooperates in the implementation of the Green Infrastructure Strategy to employ innovative approaches to control stormwater quality and quantity in the Lower Boise River watershed. Boise State University cooperates with its co-permittees to employ innovative approaches to control stormwater quality and quantity in the Lower Boise River watershed but has yet to formalize its Green Infrastructure Strategy. In line with the permit, part 3.4.2.3, Boise State University will submit the updated document as part of the Permit Renewal Application no later than April 3, 2026.
42. This Permittee organization has identified high priority locations in the jurisdiction where the Permittee regularly inspects the installation, and long-term operation, of permanent stormwater controls. **No.** Boise State University has not specifically identified permanent stormwater controls (PSCs) at new development and redevelopment sites (of at least one or more acres) as “high priority” for annual inspection. However, all PSCs are checked at least once every two years.
43. This Permittee organization has an enforcement strategy to ensure and maintain the functional integrity of permanent stormwater controls within the jurisdiction. **Yes.** All PSCs are checked at least once every two years. PSCs are cleaned and maintained on an as needed basis.

44. This Permittee organization uses a database inventory to track and manage the operational condition of permanent stormwater controls with this jurisdiction. **Yes.** [Boise State University uses a GIS map system to track permanent stormwater controls.](#)
45. This Permittee organization requires enforceable and transferable O&M Agreements, where parties other than this Permittee organization are responsible for operation and maintenance of permanent storm water controls? **Not applicable.** [At this time, Boise State University manages their own permanent stormwater controls, including coordinating required maintenance and verifying they are function as intended.](#)
46. This Permittee organization ensures that all persons responsible for reviewing site plans for permanent stormwater controls and/or for inspecting the installation and operation of permanent controls are trained to conduct such activities. **Yes.** [People responsible for PSC requirements attend appropriate training.](#)
47. This Permittee organization inspects all MS4 catch basins and inlets in the jurisdiction at least once every two years and takes appropriate maintenance or cleaning action based on those inspections. **Yes. Total Number of catch basins and inlets inspected this reporting period. 158.** [See Boise State University's SWMP Section 2.2 All MS4 catch basins are inspected at least once every two years and cleaned as needed. This list of catch basins is still in review as Boise State University is working to geo-locate all the catch basins/inlets, vortexes, sand and grease traps, and infiltration systems.](#)
48. This Permittee organization operates and maintains Streets, Roads, Highways and/or Parking Lots in its jurisdiction in a manner that protects water quality and reduces the discharge of pollutants through the MS4. **Yes.** [See Appendix 1 of this annual report \(Boise State University – SWMP 2024 Section 3.4\) for a description of water quality maintenance and pollution prevention measures. A map of material storage locations is included in Appendix 5 of this annual report \(Boise State University Stormwater Pollution Prevention Plan – SWPPP 2024\).](#)
49. This Permittee organization operates all street/road maintenance material storage locations in a manner that prevents pollutants in stormwater runoff from discharging to the MS4 or into any receiving waterbody. A description of each Material Storage Location is included in the SWMP Document, as required by Permit Part 3.5.4. **Yes.** [See Appendix 1 of this annual report \(Boise State University – SWMP 2024 Section 3.4\) for a description of water quality maintenance and pollution prevention measures. A map of material storage locations is included in Appendix 5 of this annual report \(Boise State University Stormwater Pollution Prevention Plan – SWPPP 2024\).](#)
50. This Permittee organization sweeps all streets, roads, highways and parking lots according to a sweeping management plan and the sweeping schedule outlined in Permit Part 3.5.5. **Yes.** [Street sweeping operations for pollution prevention are described in Appendix 1 of this annual report \(Boise State University – SWMP 2024 Section 3.4\), but do not meet all the requirements outlined in Permit Part 3.5.5. Boise State University will be evaluating the sweeping program and updating the Street Sweeping Plan. A description of the street sweeping plan will be available in the Phase I SWMP no later than April 3, 2026.](#)
51. The Permittee organization has reviewed its operation and maintenance activities for the types of activities listed below and confirms that all such activities are conducted in a manner that protects water quality and reduces the discharge of pollutants through the MS4. Municipal Activities to be addressed include: grounds/park and open space

maintenance operations; fleet maintenance and vehicle washing operations; building maintenance; snow disposal site operation and maintenance; solid waste transfer activities; municipal golf course maintenance; materials storage; hazardous materials storage; used oil recycling; and spill control and prevention measures for municipal refueling facilities. **Yes.** [In the Appendix 1 of this annual report \(Boise State University SWMP -2024\), it describes activities implemented to address pollution prevention and good housekeeping for MS4 operations. Boise State University will renew, update, and develop planning and guidance documents and implement as needed to ensure its stormwater infrastructure and management program includes the required SWMP control measure components described in Permit Parts 3.5.2 and 3.5.10.](#)

52. This Permittee organization ensures appropriate practices to reduce the discharge of pollutants to the MS4 associated with the application, storage, and disposal of pesticides, herbicides and fertilizer. All employees or contractors applying pesticides, etc. are instructed to follow all all label requirements, including those regarding application methods, rates, number of applications allowed, and disposal of the pesticide/herbicide/fertilizer and rinsate. **Yes.** [In the Appendix 1 of this annual report \(Boise State University SWMP -2024\), it describes activities implemented to address pollution prevention and good housekeeping for MS4 operations. Boise State University will renew, update, and develop planning and guidance documents and implement as needed to ensure its stormwater infrastructure and management program includes the required SWMP control measure components described in Permit Parts 3.5.2 and 3.5.10.](#)
53. This Permittee organization uses site specific Storm Water Pollution Prevention Plans for all Permittee-owned material storage facilities, heavy equipment storage areas, and maintenance yards located in the Permit Area. **Yes.** [Site specific SWPPPs are described in Appendix 5 of this annual report \(Boise State University SWPPP – 2024\).](#)
54. This Permittee organization ensures that all persons responsible for municipal operations and maintenance activities are trained to conduct such activities. **Yes.**

Industrial and Commercial Stormwater Discharge Management (Permit Part 3.6)

55. This Permittee organization maintains an inventory of industrial & commercial facilities within the Permit Area, and inspects such facilities on a prioritized basis as required by Permit Part 3.6. [The objective of the Industrial and Commercial Stormwater Discharge Management Program is to actively engage dischargers in protecting the quality of runoff and managing facilities and activities to prevent the discharge of pollutants associated with industrial and commercial facilities activities. Boise State University relies on ACHD, Garden City, and City of Boise to fulfill these objectives using the appropriate ordinance or control.](#)

Section V. Response to Excursions Above Water Quality Standards

56. During this or any prior reporting period, did the Permittee submit written notification to EPA and IDEZ regarding MS4 discharge that are causing or contributing to an excursion above the WQS as directed by Permit Part 5.1? **No.**
57. During this or any prior reporting period, did the Permittee submit an Adaptive Management Report to EPA and IDEQ, as directed by Permit Part 5.2? **No.** [There is](#)

record of an Adaptive Management Report being submitted by Boise State University to EPA and IDEIA because Boise State University has not received a notification from EPA or IDEQ to do so per Permit Part 5.1.

58. Provide a summary of the Permittee's efforts to date that address the MS4 discharges contributing to the original water quality excursion, including the results of any monitoring, assessment, or evaluation efforts conducted during the reporting period. ACHD, on behalf of the Permittees, continued to conduct wet weather stormwater monitoring and sub watershed monitoring as required under the Stormwater Monitoring and Evaluation Program requirements in Permit Part 6.2 Annual monitoring summaries for activities conducted in reporting year 2023-2024 (WY2024) are provided in the following attachments to this annual report:
- Appendix 7 Stormwater Outfall Monitoring Summary WY2024
 - Appendix 8 Americana Subwatershed Monitoring Summary WY2024
 - Appendix 9 Temperature Monitoring Summary WY2024
59. List any attachments submitted as part of this Annual Report:
- Appendix 1 Boise State University SWMP 2023
 - Appendix 2 Dry Weather Outfall Inspection and Sampling Summary 2024
 - Appendix 3 Vortex Structure Inspection Summary 2024
 - Appendix 4 Sand and Grease Structure Inspection Summary 2023
 - Appendix 5 Boise State University Stormwater Pollution Prevention Plan 2024
 - Appendix 6 2024 Public Education, Outreach and Involvement Program (including Website Data)
 - Appendix 7 Stormwater Outfall Monitoring Summary WY2024
 - Appendix 8 Americana Subwatershed Monitoring Summary WY2024
 - Appendix 9 Temperature Monitoring Summary WY2024
 - Appendix 10 Phase I MS4 Permit Annual Report Responses for WY2024