CITY OF BOISE
STORMWATER MANGEMENT PROGRAM PLAN
2017

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List of Document Corrections

Date	SWMP Year	Summary of Changes
March 2014	2014	Corrected T graphs (Appendix L) Updated exceedance stats (Appendix L) Added maps of Parks Dept. sites where road deicer is stored (Appendix B)
November 2014	2015	Revised SWMP for public comment
December 2015	2016	Revised SWMP for public comment
March 2016	2016	Finalized SWMP following public comment period to include minor updates to text to correct and clarify grammar and to provide an update to Appendix L for 2015
March 2017	2017	Revised SWMP for public comment to include updates, minor text changes and consolidation of appendices.
May 2017	2017	Finalize SWMP following public comment period; no public comment received.

Abbreviations

ACHD	Ada County Highway District
BMP	Best Management Practice
BSU	Boise State University
CGP	Construction General Permit
CWA	Clean Water Act
DD3	Ada County Drainage District #3
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
FTE	Full-time Employee
GB	Government Buildings
GSI	Green Stormwater Infrastructure
HCD	Housing and Community Development
IDEQ	Idaho Department of Environmental Quality
IFCAP	Idaho Fish Consumption Advisory Program
ITD3	Idaho Transportation Department, District 3
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MSGP	Multi Sector General Permit
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PDS	Planning and Development Services

PW	Public Works
SWMP	Stormwater Management Program
QA	Quality Assurance
QAP	Quality Assurance Plan
QC	Quality Control
SOP	Standard Operating Procedure
STV	Statistical Threshold Value
TMDL	Total Maximum Daily Load
TSS	Total Suspended Sediment
UM	Utility Maintenance
USACOE	United States Army Corps of Engineers
USGS	United States Geological Survey

I. Background

The National Pollutant Discharge Elimination System (NPDES) is a federal permit authorized under the Federal Clean Water Act of 1972 (as amended) that regulates stormwater and wastewater discharges to waters of the United States. The stormwater permit requirements are the result of the 1987 amendments of the Clean Water Act that created permitting obligations for three sectors, construction (Construction General Permits), industry (Multi-sector General Permits), and municipalities (Municipal Separate Storm Sewer System or MS4 permits), to address stormwater pollutants discharged to surface waters.

While NPDES is a federal permit, it is primarily administered by the states, except in the District of Columbia, six US territories, and four states, including Idaho, that are not authorized to implement the program. The Environmental Protection Agency (EPA) is the permitting authority for states or territories not authorized to conduct NPDES permitting. EPA Region 10 is the NPDES permitting authority for the state of Idaho.

The first NPDES Phase I Municipal Stormwater Permit for the Boise/Garden City Area was issued by EPA Region 10 on November 29, 2000 with a five-year term and included eleven program elements. The second Boise/Garden City Area MS4 permit was issued by EPA on December 12, 2012, became effective on February 1, 2013, and includes four general elements and six minimum control measures. The new Boise Area MS4 permit includes a number of new or "next generation" requirements recommended by the National Academies or anticipated to be included in EPA's proposed MS4 rulemaking to strengthen water quality protection. In late March 2014 EPA announced that it was deferring release of the proposed national stormwater rule and was instead pursuing an approach of incentives for implementation of the stormwater program that include the National Academies recommendations.

This document focuses exclusively on the municipal separate storm sewer system (MS4) requirements contained in the December 12, 2012 permit. The City of Boise is subject to all three types of stormwater permits for specific City activities, including the Construction General Permit for land disturbance > 1 acre (e.g. construction of sewer lines, airport, parks, municipal wastewater treatment facility, etc.); the industrial multi sector general permit (MSGP) for the airport; and, the MS4 permit to reduce or eliminate stormwater pollutant discharges.

II. Introduction

The second City of Boise and Garden City Area MS4 NPDES permit (IDS-027561) (Boise Area MS4 permit) was issued by the EPA on December 12, 2012. The permit, effective February 1, 2013, was issued for a five-year (5) term and included six co-permittees.

The Boise Area MS4 co-permittees include the Ada County Highway District (ACHD), the City of Boise (City), Garden City, Boise State University (BSU), Ada County Drainage District 3 (DD3), and Idaho Transportation Department, District 3 (ITD3).

The Boise Area MS4 permit requires each co-permittee to prepare written documentation of their Stormwater Management Program (SWMP) as implemented in their jurisdiction[1]. Organization of the documents is required to be consistent with SWMP program components contained in Parts II and IV of the permit, be submitted with the first annual report (January 2014), and updated annually. The contents of the document must include:

A physical description of the permittee's MS4

Illustrative maps and graphics

All related ordinances, policies and activities as implemented, and

An opportunity for public review and comment

As described in the following sections, many of the required SWMP elements have already been or will be implemented by the City to comply with the conditions of the permit. The City gathers, tracks, maintains and uses information on an on-going basis to evaluate SWMP development and implementation to ensure that stormwater discharges are reduced to the maximum extent practicable (MEP) and do not cause or contribute to exceedance of Idaho water quality standards.

Pursuant to the requirements of the Permit for SWMP documentation, the SWMP is organized according to program components in Parts II and IV of the permit, provides a narrative description of the City's MS4, illustrative maps and graphics, all related ordinances, policies and activities, and is advertised for public review and comment.

[1] Boise/Garden City Area MS4 permit at II.A.b (p. 6)

The document will be updated annually until the permit expires on January 30, 2018. This document fulfills the requirements for written documentation identified in section II.A.b of the permit.

III. Organization of the Document

The permit requires the document to be organized per the program components in parts II and IV of the permit and include a current narrative description of the MS4, maps, and all related ordinances, policies and activities as implemented. There are eleven program components in Section II and IV of the permit, seven in section II and four in section IV. Many of the elements are addressed in existing portions of the City's MS4 program and new requirements that must be developed and implemented by the City. This document describes the existing elements of the City's MS4 program and identifies those new elements that will be developed and implemented as required in the permit. The most recent Boise City Annual Report contains a description of current programs and activities and is available online at the Partners for Clean Water website: www.partnersforcleanwater.org. This document contains program implementation information and data from the most recent annual report to describe the City's approach to each of the required MS4 permit requirements, reporting data, or level of effort.

The Section II and IV MS4 components include:

Section II

- General Requirements
- Six Minimum Control Measures
- Discharges to Water Quality Impaired Receiving Waters
- Reviewing and updating the SWMP
- Transfer of ownership, operational authority, or responsibility for SWMP Implementation
- SWMP Resources
- Legal Authority

Section IV

- Monitoring
- Recordkeeping
- Reporting Requirements
- Addresses

IV. Narrative Description of the City's MS4

Boise City, Idaho is the capitol and most populous city in Idaho. According to the 2013 US Census, the combined Boise City and Garden City population was 227,702[2]. The permit area covers an area of 120 square miles in 2012. The Boise metropolitan area is home to more than 616,000 people. Boise has an annual average precipitation of approximately 11.7 inches per year and an annual average snowfall of 19.4 inches per year based on National Oceanic and Atmospheric Administration (NOAA) Western Regional Climate Center data.

EPA's analysis of average rainfall depth in the Boise area, based on 48 years of 24-hour precipitation data obtained from NOAA and collected at the Boise Airport, demonstrates that approximately 95% of all storms in the Boise area result in a rainfall volume of 0.6 inches or less; 90% of all storms result in a rainfall volume of 0.47 inches or less.

The MS4s subject to the permit are owned and operated by the permittees: Boise City, Garden City, ACHD, BSU, ITD3, and DD3. The MS4s are located within the corporate boundaries of the City of Boise and the City of Garden City. The permit authorizes storm water discharges from the MS4s owned or operated by the permittees to the Boise River and other waters of the United States within the greater Boise/Garden City area.

The Boise Area MS4 includes many publicly-owned conveyance or system of conveyances used for collecting and conveying storm water which discharges to waters of the United States. MS4s include roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, and/or storm drains. Surface runoff within the Boise/Garden City area is directed to a wide network of subsurface conveyances, ditches, and surface streets. These MS4s provide drainage for areas within the Boise/Garden City boundaries under the direct jurisdiction of the permittees. Within the permit area the MS4s are owned and operated as follows:

- ACHD owns and operates all public roadways and associated storm water conveyances, except routes and storm water facilities operated solely by ITD3. ACHD, the co-permittees, and private entities are responsible for approximately 1,069 outfalls discharging to Boise River and its tributaries within the permit area.

[2] US Census Idaho Quick Facts http://quickfacts.census.gov/qfd/states/16/1611260.html

- ITD3 owns and operates the conveyances and storm water facilities associated with Interstate-84, Interstate-184, U.S./State Highways 20, 21, 26, 30, 44, and 55; Glenwood Street, Chinden Boulevard, and the Chinden-Broadway Connector. Drainage facilities include gutters, culverts, ditches, swales, pipes, poly drains, french drains, catch basins/inserts, sand & grease traps, edge drains, transverse drains, and retention/detention ponds. ITD3 is responsible for at least two known outfalls within the permit area, located near Barrister Drive and Cole Road, and Americana Boulevard at Kathryn Albertson Park.
- Boise City has jurisdiction over City owned facilities, private property within its city limits, and floodway conveyances. Major and minor outfalls owned or operated by the City are associated with the natural and modified foothills floodway conveyance systems, ponds, and dams. Properties owned or operated by the City that have discharge directly to surface water bodies include: a short road segment located within Julia Davis Park; a short road segment located within Ann Morrison Park, Discovery Center parking lot, land adjacent to the Boise Airport, and the Fire Department Training Station. The parking areas of the Boise Library, Log Cabin Literary Center, and Library Annex discharge into a large diameter ACHD MS4 pipe 250 feet from its river outfall. Other drainage outfalls include Crane Creek flume outfall, Sand Creek flume outfall, Hulls Gulch flume discharge into Crane Creek flume; Cottonwood Creek flume outfall, and the Roanoke pond outfall into ACHD system. These outfalls existed before the effective date of the Boise Area MS4 permit. Discharges are authorized according to the conditions of the current NPDES permit.
- Garden City has jurisdiction over their facilities and private property within its city limits; at least one known outfall discharges directly from City property to the Boise River.
- DD3 owns and operates drainage channels and drain pipes in the southeast section of Boise. The DD3 system receives drainage from storm drains under ACHD control, irrigation runoff from irrigated land and irrigation canals, and drainage from both residential and commercial development. DD3 is responsible for eight known storm water outfalls.
- BSU is responsible for 153 acres of State owned university land adjacent to the Boise River south of Julia Davis Park. Facilities consist of drainage conveyances, drop grates, and manhole/catch basin structures. BSU is responsible for eight known storm water outfalls that discharge from the campus directly to the Boise River.
- According to an inventory of major outfalls (i.e., those outfalls of at least 36 inches in diameter or greater) submitted by the permittees as part of the Year 2009-2010 Annual Report, these MS4s discharge to the Boise River and its

tributaries, including but not limited to: North Slough; South Slough; Milk Lateral; Gruber Lateral; Settlers Canal; Chaffin Ditch; Ridenbaugh Canal; Wilson Fruit Lateral; Five Mile Creek; Synder Lateral; Threemile Creek; Boise City Canal; Crane Creek; Davis Drain; Thurman Mill Canal; Drain A; Drain A-1; Drain B; Drain E; Julia Davis Pond; Dry Creek; Logger Creek; Powell Lateral; Rust Lateral; Farmers Lateral; Bennett Lateral; Rossi Mill; New York Canal; Eagle Drain; Riverside Creek; Elmore Drain; Warm Springs Canal; Zinger Lateral; Karnes Lateral; Farmers Union Canal; Lake Elmore; Stewart Gulch; Dry Creek Canal; Boise Valley Canal; and Hull's Gulch.

The Public Works Department (PW) is responsible for managing Boise City's stormwater program and water quality programs. Other City entities with major permit-related responsibilities include: Planning and Development Services (PDS), including Housing and Community Development (HCD); Parks and Recreation (Parks); Airport; Utility Maintenance (UM) (a division of Public Works); Government Buildings (GB) (a division of Public Works working on behalf of the Fire Department), and Library!.

A total of 663 permanent stormwater structures at 139 locations are summarized by managing Department in Table 1.

Table 1: Inventory of City Owned Permanent Stormwater Structures

Department	Structures*
Airport	101
Government Buildings/Fire and Rescue	257
Planning and Development Services/ Housing and Community Development	10
Library!	20
Parks	383
Utility Maintenance/Foothills Conveyance	17
Total	788

**Some Departments track multiple stormwater facilities as part of an entire site or facility that they manage.*

All City properties either retain and infiltrate an approximate 1-inch depth of stormwater per 1/hour precipitation event, discharge stormwater under another NPDES permit or, discharge stormwater to another jurisdiction with their permission (i.e. drainage or irrigation entity, ACHD, state highway, etc.).

A map of the current municipal MS4 boundaries is found in Appendix A.

V. General Requirements

The MS4 permit contains four general requirements that apply to each of the co-permittees (i.e. reduce pollutants to MEP) or are activities that the co-permittees will jointly accomplish (i. e. subwatershed planning). The four requirements include:

Reduce pollutants to the maximum extent practicable (MEP)

Shared implementation with outside entities

Modification of the SWMP

Subwatershed planning

A. Reduce Pollutants to the Maximum Extent Practicable

A.1 Stormwater Management Program Plan

The City develops, annually updates and implements a Stormwater Management Program Plan (SWMP) intended to meet the general and specific requirements (minimum control measures) identified in the 2013 MS4 Permit.

The SWMP identifies existing or ongoing programs and new requirements that remain to be completed prior to the end of the current Permit term.

The SWMP includes the required documentation identified in the Permit and is updated annually, with public notification and opportunity for comment as required.

The SWMP identifies accomplishments and statistics that will be reported in each Annual Report.

A.2 New Permit Program Requirements

The 2012 Boise/Garden City Area MS4 permit includes new requirements and submittals with completion dates ranging from July 1, 2013 through January 30, 2018. The new requirements in the permit are described below in each of the following sections of the SWMP and a summary table titled “Status of Control Measures” for all program requirements in Sections II and IV is provided in each annual report.

B. Shared Implementation with Outside Entities

The City of Boise is one of six co-permittees responsible for implementation of the Boise/Garden City Area MS4 permit. The permit provides the option for co-permittees to individually or jointly meet permit obligations. The co-permittees have developed an intergovernmental agreement that identify three shared responsibilities (monitoring, administration, and public education) and individual agency cost share support for each of these obligations. The agreement also provides a mechanism for joint funding of other permit activities (e.g. subwatershed planning) that will occur during the term of the permit. The permit requires that the co-permittees update the intergovernmental agreement no later than July 1, 2013. The co-permittees have updated the Intergovernmental Agreement (see Appendix B) as required by the permit.

The 2013 Intergovernmental Agreement identifies ACHD as the lead for administration and monitoring requirements identified in Section IV of the permit (i.e. stormwater monitoring and evaluation, outfall monitoring, and dry weather discharge screening) and Boise City as the lead for public education.

C. Modification of the SWMP

The permit provides for modification of the SWMP in accordance with Part II.D[3] of the permit. Part II.D requires that permittees annually review their SWMP in preparation for the annual report and provides a process for the permittees to request minor modifications of the SWMP or EPA to require changes to the SWMP to address MS4 impacts to water quality or exceedances of state water quality standards.

D. Subwatershed Planning

The permit requires that the permittees jointly complete at least two individual subwatershed plans no later than September 30, 2016.

ACHD completed the sub-watershed plans in 2016. Details are provided in the ACHD Annual report and the plans are available at the Partners for Clean Water website.

[3] The permit references Part II.E, Transfer of Ownership, Operational Authority, or Responsibilities for SWMP Implementation, instead of Part II.D Reviewing and Updating the SWMP, which appears to be the more appropriate reference.

VI. Six Minimum Control Measures

The 2012 permit contains six minimum control measures, including:

A. Construction Site Runoff Control Program

B. Stormwater Management for Areas of New Development and Redevelopment

C. Industrial and Commercial Stormwater Discharge Management

D. Stormwater Infrastructure and Street Management

E. Illicit Discharge Management

F. Education, Outreach and Public Involvement

A. Construction Site Runoff Control Program

A.1 Existing Program

Construction site erosion control programs are developed by each co-permittee in their respective areas of responsibility. For example, Boise City has ordinances that establish construction site erosion control permitting, inspection, training and certification, enforcement, and fees requirements. ACHD implements construction site runoff for projects through a permit program for work in the right of way that generates two (2) cubic yards or more of material.

Boise City's construction site erosion control program is based on the requirements in Boise City Code (BCC) 8-17, Construction site erosion control ordinance. The ordinance identifies the construction site runoff permitting, erosion control plan, best management practices, inspection, training and certification, fee, and enforcement provisions, requirements, and process required by the City. The Boise ordinance provides construction site controls that are at least as stringent as the federal General Construction Permit requirements. The ordinance requires erosion and sediment control for all construction sites in the foothills and in environmentally sensitive areas (e.g. adjacent to water bodies) regardless of project size. In FY2016 1,714 permits were issued covering 1,248 acres in the City.

To implement the requirements of the MS4 permit and enforce BCC 8-17, the program employs two full-time employees (FTE) that serve as Erosion and Sediment Control Inspectors. In addition to the two FTEs, building, mechanical, electrical and plumbing inspectors are cross-trained in Erosion and Sediment Control (ESC) inspection. The inspectors also contribute to the ESC program.

In FY2016 a total of 6,367 ESC inspections were conducted with 5,393 passing or complete, 743 having ongoing deficiencies, and 231 that failed. Scaled enforcement resulted in 81 complaint investigations, 36 conferences, and 15 stop work orders.

Planning staff assist in regularly inspecting sites for compliance with local landscaping regulations and ensure final stabilization has been achieved. The planners verify that final stabilization of a site has taken place when they complete their inspection to verify that the proper landscaping has been installed per City ordinance. Code Enforcement officers also receive ESC training and inform the ESC manager of projects that appear to be in non-compliance so that a complaint or random inspection is scheduled.

Training and certification are also important elements of the program. In FY2016, in addition to staff training, 635 Responsible Person licenses and 49 Plan Designer licenses were issued or renewed.

A.2 New Program Elements

All new MS4 Permit program requirements have been completed and incorporated where applicable into existing programs.

B. Stormwater Management for Areas of New and Redevelopment

B.1 Existing Program

New and redevelopment stormwater management is addressed by each co-permittee in their respective areas of responsibility. For example, the ACHD manages roadway related development including roadways and residential subdivision projects.

Boise City manages stormwater for industrial, commercial, institutional, multi-family residential and private street development and redevelopment projects within Boise City limits. BCC 8-15 governs stormwater and the building permit process is used to ensure compliance for new and redevelopment projects.

Projects increasing or modifying impervious surface areas above specified thresholds must submit drainage and grading plans. Stormwater requirements are detailed in the Boise Stormwater Design Manual which was last updated in September 2015, and contains retain on site requirements for the one hour 50 year or one hour 100 year for development < 10 acres and > 10 acres respectively. Plans are required to include drawings detailing the drainage and treatment system, calculations and operating / maintenance requirements. Systems utilizing infiltration must also include geotechnical reports demonstrating suitable soil conditions.

Staff utilizes a checklist to ensure that plans are in compliance with the Design Manual. Sites with high pollutant loads or special circumstances are reviewed for additional requirements. Any variances require review and approval by the Assistant City Engineer. Drainage plan approval is required before the building permit is issued for construction. Boise City also regulates all types of development and redevelopment in high grade areas in accordance with the manual. Approved projects require site inspections at specified stages in construction to ensure facilities are constructed as designed. Building occupancy permits are not granted if grading and drainage conditions are not met. Copies of the operating / maintenance requirements are mailed to the facility approximately one year after construction to ensure the facility operators are aware of these needs.

Copies of the approved drainage and grading plans (including all supporting documents) as well as the construction inspection records are retained in the City's electronic document retention system.

B.2 New Program Elements

The 2012 Boise Area MS4 permit includes many New and Redevelopment requirements which are listed in Table 2 below.

Table 2: New Permit Obligations for New and Redevelopment

New Permit Required Activity/Element	Requirement	Timeframe	Status/ Approach
II.B.2.a Ordinance and other regulatory mechanisms	Adopt 0.6" 24 hour retain on-site performance standard. Develop offset program for sites unable to attain the standard. Procedures for review and approval of permanent SW management plans.	Submit revised ordinance or other regulatory mechanisms with 5th year annual report.	City staff is currently considering an offsite mitigation (offset) program and plans to complete necessary ordinance updates in 2017.
II.B.2.b Stormwater Design Criteria Manual	Update Stormwater Design manual to include: • acceptable permanent STW management/control practices • manual must include: - incentives for site based practices; and - list of acceptable practices, and specifications for long term operation and maintenance, including self- inspection checklists.	September 30, 2015	Public Advisory Group (PAG) met and updated STW Design Manual in September 2015 to meet new permit requirements. Completed.
II.B.2.c: Green Infrastructure Incentive Strategy and Pilot Projects	Green Stormwater Infrastructure (GSI) incentives and strategy for public and private sector with reference to GSI pilot projects and with public notice and comment opportunity.	September 30, 2015, submit in Jan 2016 Annual Report.	GSI Strategy and Incentives drafted in September 2015, put out for 30-day public review and on the Partners for Clean Water Website.
	Selection of three selected GSI pilots, with effectiveness evaluation for water quality and quantity.	Third annual report status, completion prior to expiration.	Bown Library!, the third demonstration project will be finished in early 2017.
	GSI pilot progress report.	4th year annual report	
	GSI pilot final report.	5th year annual report	

New Permit Required Activity/Element	Requirement	Timeframe	Status/ Approach
	Riparian Zone Management and Outfall Disconnection.	September 30, 2015	City contracted with USACOE to conduct Riparian Study, which was completed in September 2015 and is available on the Parks website[4].
	Identify and prioritize riparian areas for acquisition and protection.	Prior to expiration of permit 3rd year annual report.	
	Complete one project that treats reduces flow of untreated MS4 discharge using vegetated swale, wetland, or other technique.	5th year annual report.	To be completed by Partner Agency
	Submit a list of prioritized riparian protection areas, status report on outfall disconnect project.	5th year annual report	Develop prioritization list from USACOE study
	Documentation of completed outfall disconnection project.	Term of the permit, summary in year 5 annual report	To be completed by Partner Agency
	Repair of Public Streets, Roads, and Parking lots.	Term of permit	Ongoing activity.
	Report road and parking lot feasibility assessments and implementation over the duration of the permit.	Summary in year 5 annual report	The City completed an analysis for two projects in FY 2016 subject to these requirements (Fire Stations 4 and 8).

[4] US Army Corps of Engineers, 2015, Boise Riparian Corridor Stewardship Plan; 82 p, September 2015, USACOE, https://parks.cityofboise.org/media/1116011/2015Sep21_BoiseRiparianCorridorStewardshipPlanwithMaps.pdf, accessed November 2015

New Permit Required Activity/Element	Requirement	Timeframe	Status/ Approach
II.B.2.e O&M of Permanent Storm Water Management Controls	Database tracking all new public and private permanent stormwater controls	January 30, 2018	Database development is complete, data entry to complete project is ongoing.
	Require legally enforceable and transferrable O&M agreements for permanent stormwater controls	No date included in the permit, link to ordinance update	Completed
II.B.2.f Inspection and Enforcement	Develop prioritized O&M inspection program for all permanent controls. Priority based on size, receiving water sensitivity, and compliance history. High priority sites inspected annually. Program must have scaled enforcement component and recordkeeping.	September 30, 2017	Program development in progress
II.B.2.g Education and Training on Permanent Stormwater Controls	Begin training program for selection, design, installation, operation and maintenance of permanent controls	September 30, 2015	Ongoing. See Public Education section.
	Annual training for new & redevelopment plan reviewers, inspectors, and local audiences	September 30, 2016	Ongoing.

C. Industrial and Commercial Stormwater Discharge Management

C.1 Existing Program

The 2000 Boise/Garden City Area MS4 permit required the permittees to develop an inventory of industrial and commercial dischargers to the MS4, to prioritize and inspect/monitor "high risk" facilities for compliance with local stormwater ordinance (Title 8, Chapter 15 and the Multi Sector General Permit (MSGP) requirements), distribute educational materials during commercial and industrial inspections, and annually report on commercial and industrial inspections.

These requirements were accomplished through a contract arrangement between ACHD and Boise City Public Works Pretreatment for development and management of an industrial/commercial priority database, with inspection services provided by the City's Industrial Pretreatment Program. In addition, to the high risk site inspections required in the permit, commercial and industrial facilities subject to the City's pretreatment program requirements include a general stormwater inspection component to evaluate conveyance and treatment structures and outside material storage or "wet" processes.

Issues identified during these pretreatment inspections needing corrective action are tracked to resolution in a separate stormwater component of the Industrial Pretreatment database. The high risk and the pretreatment databases provide for the tracking of educational material distributed and inspection activity that has been in the annual reports.

C.2 Future Program Requirements

The 2012 Boise Area MS4 permit requires the permittees to implement industrial and commercial MEP controls and training. The permit includes new industrial and commercial stormwater management requirements that are identified in Table 3.

Table 3: New Permit Obligations for Industrial and Commercial and Stormwater Management

New Permit Required Activity/Element	Requirement	Timeframe	Status/Approach
II.B.3.a Inventory of Industrial and Commercial Facilities/Activities	Update inventory of commercial and industrial facilities including watershed/receiving water and SIC code	September 30, 2016	ACHD contracts with City of Boise for this work, the database is continuously updated as part of the Planning and Development Services Plan review process. Two facilities with direct discharge to City owned MS4, begin annual inspections in FY2017.
	Permittees select at least two industrial/commercial sectors/activities not being addressed by current program for BMP development and training	September 30, 2016	Additional sectors identified and initial training and outreach materials developed.
II.B.3.b Industrial and Commercial Facility Inspections	Update agreement to prioritize and inspect industrial and commercial facilities, including: - Establish priorities and procedures for inspections - Record facility inspections - Report inspection findings and follow-up as necessary, including scaled enforcement - Monitoring/self-monitoring requirements	September 30, 2016	Inspection program on-going. Process and procedures to be modified as necessary. Currently coordinating with ACHD to update inspection agreement.

D. Stormwater Infrastructure and Street Management

D.1 Existing Program

The permit includes new and existing requirements for management of public properties and stormwater infrastructure and street management to minimize the discharge of pollutants to the MEP. All co-permittees currently implement some of the stormwater infrastructure and street management responsibilities required by the permit. The activities include: catch basin and inlet cleaning, sweeping of roads and parking lots, storage and management of traction solids and liquids, appropriate application of landscape chemicals (e.g. pesticides, herbicides, and fertilizers), appropriate storage of materials in maintenance yards and facilities, and litter control. ACHD owns and maintains the majority of the stormwater infrastructure and is the lead agency for stormwater infrastructure management as identified in the original and updated Intergovernmental Agreement (Appendix B).

Boise City manages approximately 778 stormwater structures at various locations throughout the City, primarily located at Parks, non-MSGP Airport operated facilities and other Government Buildings. Additionally, the City has 11 regulated outfalls, five foothills conveyances including eight ponds and four dams; and a limited number of roads at the Parks, Airport, and Fire Training Center. Boise City has implemented many BMPs to control the discharge of pollutants to the MS4, including catch basin and inlet inspection and cleaning, road and parking lot sweeping, appropriate storage and management of chemicals and materials at maintenance facilities, Integrated Pest Management at Parks and Greenbelt facilities, application of phosphorus free fertilizers on Parks established turf, litter control, and public information and education. A summary of these activities is contained in the Annual Reports of Boise City activities.

D.2 Future Program Requirements

The 2012 Boise Area MS4 permit requires permittees to implement multiple new BMPs in addition to the existing BMPs for infrastructure and street management. The new requirements are identified in Table 4 below.

Table 4: New Permit Obligations for Stormwater Infrastructure and Street Management

New Permit Required Activity/Element	Requirement	Timeframe	Status/Approach
II.B.4.a Storm Sewer System Inventory and Mapping	Develop comprehensive inventory and map of the MS4 and associated outfall locations, including: - all inlets, catch basins, pipes, and outfalls - all structural flood control devices - names and location of receiving waters receiving MS4 discharges - all existing structural stormwater treatment controls - subwatersheds, associated land use, and approximate acreage for each outfall - permittee owned vehicle maintenance, materials storage, maintenance yards, snow disposal sites, parking lots, and roadways	January 30, 2018 (The permit reapplication actually requires submittal of inventory and map information prior 180 days prior to the required due date for this item identified in the permit.)	The City has purchased an enterprise-wide asset management software with GIS capabilities. Development of the database framework and uploading of the approximately 621 City-owned stormwater structures, conveyances, dams, and roads will occur in FY2014-2017 and be ready for submittal in the MS4 reapplication materials no later than 180 days prior to expiration of the permit.
II.B.4.b Catch Basin and Inlet Cleaning	Initiate an inspection program (at least once every two years) and appropriate maintenance/cleaning program.	September 30, 2016	City facilities being inspected and maintained as necessary.

New Permit Required Activity/Element	Requirement	Timeframe	Status/Approach
II.B.4.c Street and Road Maintenance	Update street, road, and parking lots >3,000 sf maintenance SOPs to reduce discharge to the maximum extent possible, including: - Street, road and parking lot anti/deicing - Street/road chemical/material storage - Green infrastructure maintenance	September 30, 2015	Update all City department street, road and parking lot SOPs.
	Maintain and report annually inventory of street/road maintenance materials, including sand and salt.	Term of the permit.	Continue annual reporting of road maintenance material use and inventory.
II.B.4.d Street, Road, and Parking lot Sweeping	Update road/parking lot sweeping plan to be consistent with sweeping frequency required by the permit (Table II.B-2 or more frequent).	September 30, 2015	City department road/parking lot sweeping schedules and sweeping activities reported annually.
	Road/Parking lot inventory and map submitted with 2nd year annual report.	September 30, 2014	Inventory and Map reported in year 2 Annual Report
	Annual reporting of sweeping effectiveness to minimize pollutant discharges to the MS4 and receiving waters, including: - significant changes in road/parking lot inventory or map and reason for the change - sweeper type, swept lane miles, dates, locations, and frequency category, volume or weight of materials, and representative sample of particle size of swept material - public/other outreach efforts for excess leaves and other material	Term of the permit.	Reported annually.
II.B.4.f Develop and Implement SWPPP	Develop and Implement SWPPP for Maintenance and Materials Storage Facilities	September 30, 2015	Develop and implement SWPPP as required.

New Permit Required Activity/Element	Requirement	Timeframe	Status/Approach
II.B.4.g Stormwater Management	Ensure that any stormwater management projects after the effective data are designed and implemented to prevent adverse impacts on water quality.	Term of the permit	Design review process for all projects. Retrofits identified and implemented with redevelopment activities.
	Evaluate the feasibility of retrofitting existing control devices to provide additional pollutant removal.		
	Identify and all locations where retrofit opportunities are feasible, including funding source, project timeline/schedule.	January 30, 2018	
II.B.4.i Training	Provide regular training to appropriate staff for all O&M procedures.	September 30, 2015	Trained staff conduct annual O&M inspections and work orders as needed, including annual conferences, illicit discharge Annual Training implemented through in-house employee training system.

E. Illicit Discharge Management

E.1 Existing Program

The co-permittees have joint responsibility for implementation of Illicit Discharges. This is accomplished through actions by the co-permittees to address various portions of the Illicit Discharge management program.

The City of Boise Stormwater Management and Discharge Control Ordinance (BCC-8-15) defines illicit discharges and connections and prohibits both.

The City addresses illicit discharges using multiple mechanisms, including but not limited to physical inspection of the foothills conveyances, commercial and industrial stormwater inspections, and hotline complaint response.

ACHD is the owner of most of the stormwater infrastructure and has developed and implemented an illicit discharge and dry weather monitoring program. The City MS4 with connection to surface waters is very limited and is comprised primarily of the Parks and Airport systems and the Roanoke ponds. Illicit discharges are reported to the hotline and Boise City or ACHD staff respond, document, and resolve the issues as reported in the Annual Report. New in the Annual Report this year will be a map of illicit discharges, including recurring discharges, to better focus illicit discharge public education or other efforts.

In general, illicit discharges may be identified through on-going inspection programs, complaints received through the stormwater hotline, dry weather screening activities or other mechanisms. The Partners work cooperatively to resolve illicit discharges and report annually on any relevant findings.

The City implements a Household Hazardous Waste Mobile Collection program to provide appropriate collection, storage, and disposal of used oil and toxic materials that are prohibited from discharge to the MS4. Commercial entities also are able to participate in the program for a fee.

E.2 Future Program Requirements

The 2012 Boise/Garden City Area MS4 permit requires the permittees to implement the Illicit Discharge Management program described at II.B.5. The City of Boise owns only a small portion of the MS4 so the majority of the program is implemented by ACHD. The co-permittees will review the Illicit

Discharge Management program requirements and implement the necessary new program elements separately or by contract.

The City of Boise has contracted and ACHD has completed illicit discharge dry weather monitoring, and provided the City results of the illicit monitoring for 2015. The City anticipates ACHD will conduct this component of our program annually.

New elements the Illicit Discharge Management program is anticipated to include are identified in Table 5 below.

Table 5: New Permit Obligations for Illicit Discharge Management Program

New Permit Required Activity/Element	Requirement	Timeframe	Status/Approach
II.B.5.c Illicit Discharge Mapping	Map of reported and documented illicit discharges or connections with annual updates	September 30, 2014	ACHD has the majority of Illicit Discharge monitoring responsibilities, records and GIS capabilities; however other co-permittees also address illicit discharges separately, so coordination between the co-permittees on development of this map will need to occur.
II.B.5.d Dry Weather Outfall Screening	Develop and implement dry weather screening program	September 30, 2015	Ongoing. City contracts with ACHD for dry weather screening services.
II.B.5.h Training	Annual training for staff and inspectors on identification of illicit discharges/connections and spills to the MS4.	September 30, 2014	The Partners for Clean Water purchased Illicit discharge/connection training videos to facilitate annual training for all co-permittees.

F. Education, Outreach and Public Involvement

F.1 Existing Program

In accordance with the 2000 Boise/Garden City Area MS4 permit the Public Education and Outreach program was developed to inform and educate the public of the impact of pollutants in stormwater and how to protect stormwater runoff. The specific goals agreed upon by the co-permittees for the public education and outreach program include:

- To meet the basic requirements as outlined in the permit;
- Use education and outreach methods that are cost-effective;
- Use education and outreach methods that efficiently change behavior.

Using a coordinated effort, the co-permittees set out to achieve the following program objectives:

- Create synergy by drawing upon and supplementing existing, successful outreach efforts such as recycling, household hazardous waste, Water Awareness Week, etc.;
- Develop a broad-base vision for stormwater education and outreach through annual report and future planning effort feedback;
- Increase awareness among a large, diverse population and educate target audiences about solutions to stormwater management; and
- Document and demonstrate that the education outreach effort resulted in behavior change that reduces pollution.

F.2 Future Program Requirements

The 2012 Boise Area MS4 permit includes new requirements with completion dates ranging from September 30, 2014 through January 30, 2018 in section II.B.6 of the permit. The permit identifies four items that must be achieved to meet the goal of reducing or eliminating behaviors and practices that cause or contribute to adverse stormwater impacts. They are described in Table 6 below.

Table 6: New Permit Obligations Education, Outreach and Public Involvement

New Permit Required Activity/Element	Requirement	Timeframe	Status/Approach
II.B.6.b. Implement Ongoing Education Outreach and Involvement Program	Extend existing education program to five target audiences (general, businesses including home based and mobile, homeowners, landscapers, property managers, engineers/ contractors/developers, municipal planners/design review staff, urban farmers & community gardens) for specific topics Assess BMP understanding/adoption by five target audiences to direct education and outreach program	September 30, 2014	Boise City met the September 2014 education and outreach requirements. Details in 2015 Annual Report.
II.B.6.c Targeted Education and Training	Targeted training for: Construction stormwater management for site operators and permittee staff Permanent stormwater control training for project operators and permittee staff Stormwater infrastructure and street management / maintenance for permittee staff Illicit discharge management training for permittee staff	No specified date. Ongoing training for construction site operators and permittee staff, stormwater infrastructure/ control staff, and for illicit discharges for inspection and complaint response staff	Multiple on-going training activities.
II.B.6.d Stormwater Website	Maintain and promote publically accessible website that contains / summarizes: - all permittees SWMPs relevant information (ordinances, manuals, annual reports, etc.) - draft and final SWMPs and comment opportunity - links to construction/post construction education, training, licensing, permitting, applicable ordinances, policies, and guidance - links/information for appropriate industrial and commercial controls	February 1, 2014	The City completed the Website update in January 2014 as required by the permit.

	- information or links for the public to report illicit connections or dumping activities - permittee contact information, including relevant staff phone, physical address, and electronic mail address and stormwater hotline phone/email address		

VII. Discharges to Water Quality Impaired Receiving Waters

The permit contains a new section that includes three requirements:

- Conduct stormwater monitoring as required in the permit (Part IV);
- Identification of the pollutant or pollutants of concern for individual segments of three water bodies (Table II.C);
- Each permittee's SWMP must include a description of how activities of each control measure are implemented to control the discharge of pollutants of concern and ensure the discharge will not cause or contribute to an excursion of water quality standards, including how the permittees evaluate and measure the effectiveness of the SWMP. For SWMP elements requiring multiple years to implement, the permittees must provide interim updates on progress to date beginning in the first annual report, and annually thereafter.

Boise City developed two new sections in the first and each subsequent annual report that describes the Status of Control Measures, including progress toward implementation of all controls and Assessment of SWMP Control and Water Quality, to assess the effectiveness of SWMP controls and determine if stormwater is causing or contributing to the exceedance of water quality standards. Both sections will be updated annually to track progress on all permit requirements and assess SWMP effectiveness at meeting state water quality standards. The 2016 SWMP Effectiveness Assessment for Meeting Water Quality Standards is included as Appendix E and contains assessment data from the most recent Boise City MS4 Annual Report.

VIII. Reviewing and Updating the SWMP

The permit contains requirements for annual review and update of the SWMP. The key provisions of this section include:

- Annual review of SWMP actions and activities as part of the annual report preparation;
- Process and procedures for permittees or EPA to request changes to any SWMP action or activities specified in the permit; and
- Permit modifications would be accomplished using procedures in EPA regulations.

IX. Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation

This section of the permit requires the permittees to implement the actions and activities identified in the SWMP in all new areas added or transferred to the permittees MS4 as soon as practicable but not longer than one year after the transfer of the new areas and identification of additions and schedules for implementation in the subsequent Annual Report following the transfer.

The City currently implements the SWMP including within any new areas added to our MS4 (e.g. annexation).

X. SWMP Resources

This section of the permit includes three elements:

- Requirement for the City to provide adequate finances, staff, equipment, and support capabilities to implement the SWMP
- Annually report the total costs associated with SWMP implementation
- Encouragement to establish consistent funding source for program implementation

The City has and will continue to provide adequate resources and annual cost estimates of SWMP implementation in the Annual Report. The City Annual Reports estimated the total implementation cost for the MS4 program of $911,859 in FY 2016.

XI. Legal Authority

The permit requires the permittees to have adequate legal authority at Part II.G to implement and enforce the SWMP required elements and to review and update ordinances as necessary no later than January 30, 2014.

The City established legal authority to implement the 2000 Boise/Garden City MS4 permit. Boise City legal staff reviewed the City's legal authority to implement the 2012 permit below.

The City of Boise has adequate legal authority through the BCC, specifically the Boise City Stormwater Management and Discharge Control Ordinance (BCC 8-15) and Boise City Construction Site Erosion Control Ordinance (BCC 8-17), the adopted Boise Stormwater Management Design Manual and the co-permittee Intergovernmental Agreement to control pollutant discharges into and from its MS4 to meet the 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:

- BCC 8-15-02: Discharge Regulations and Requirements- Prohibits illicit discharges to any storm drain, including both the MS4 and private storm drains. BCC 8-15-1.03(N) defines Illicit Discharge
- BCC 8-15-02.02: Illicit Connections- prohibits illicit drainage connections to the MS4 or to commence or continue illicit discharges to the MS4. BCC 8-15-1.03(M) defines Illicit Connection.

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:

- BCC 8-15-02.01: General Requirements and Prohibitions – prohibits non-stormwater and pollutant discharges to MS4
- BCC 8-15-2.03: Parking Lots and Similar Structures- regulates non-stormwater discharges to MS4s from parking lots and similar structures
- BCC 8-15-03.05: Outdoor Storage Areas; Commercial and Industrial Facilities – contains illicit discharge and spill prevention/containment system requirements

- BCC 8-15-2.05 and BCC 8-17 regulate prohibited discharges from Construction Sites
- BCC 15-2.06 and adopted Boise Non-Stormwater Disposal Best Management Practices prohibit non-stormwater use of storm drains except under regulated and defined exceptions

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 Municipal Stormwater Permit (Permit #IDS-02756-1) and Operating Guidelines. (Appendix B)

Criteria 4: Must have authority to require compliance with conditions

Satisfying legal authority:

- Idaho Code Section 50-302: Grants cities in Idaho to authority to pass ordinances and regulations and enforce ordinances by fines of up to $1000 and/or incarceration of up to 6 months
- BCC 8-15-04.01-Inspections- provides for the inspection of private and public stormwater systems
- BCC 8-15-04.02 and 04.03-Sampling and Monitoring- allow the City to require sampling, testing and monitoring
- BCC 8-15-04.04- Violations Constituting Misdemeanors-makes failing to comply with the provisions of the Stormwater Ordinance a misdemeanor
- BCC 8-15-04.07: Acts Resulting in Violation of Federal Clean Water Act- makes violations subject to criminal and civil sanctions
- BCC 8-15-04.08-Violations Deemed a Public Nuisance-allows for violations of Ordinance to be declared a nuisance and summarily abated
- BCC 8-15-04.09: Civil Actions- provides for enforcement of Ordinance provisions through civil actions including injunctions and cost recoveries
- BCC 8-15-04.10: Administrative Enforcement Powers- provides for administrative enforcement including cease and desist orders and notices to clean

XII. Monitoring

The Intergovernmental Agreement (Appendix B) designates the ACHD as the lead agency responsible for implementation of the MS4 monitoring obligations identified in section IV of the permit. The City and other co-permittees fund their respective share of the monitoring program costs per the percentages contained in the Intergovernmental Agreement and the annual budget meeting held in January of each year.

The City of Boise has two wastewater NPDES permits issued by EPA authorizing discharge to the Boise River. The permits contain significant receiving stream monitoring requirements upstream and downstream of the two wastewater treatment facilities, including composite grab for chemical and physical parameters, continuous monitoring for dissolved oxygen and temperature, and watershed based mercury fish tissue testing that occur within the 2012 Boise/Garden City MS4 area. The Boise River sampling locations required in the wastewater permits are Veteran's Parkway Bridge, Glenwood Bridge, and Eagle Bridge on the South Channel of the Boise River.

The City has high quality data for the Boise River in the MS4 reach since before the Boise/Garden City MS4 permit was issued in 2000 for all four pollutants of concern as identified in the 2012 Boise/Garden City MS4 permit. The City has used this data to assess the effectiveness of the Boise/Garden City MS4 program.

The City initiated in an in-stream study to assess the watershed based mercury in fish tissue. EPA and the Idaho Department of Environmental Quality (IDEQ) approved the proposed watershed based mercury fish tissue testing plan prepared by the United States Geological Survey (USGS) on behalf of the City. In FY2013 the USGS initiated the watershed based mercury fish tissue sampling at six sites, three on the Boise River, two on the Snake River, and one on Brownlee Reservoir. In March 2014, the City provided a report of the first year sampling results to EPA, IDEQ, and Idaho Fish Consumption Advisory Program (IFCAP). In FY2014, USGS sampled one site on the Boise River and the City provided a report to EPA, IDEQ, and IFCAP in March of 2015. In October 2015, USGS sampled six sites, and has sent the samples to the lab for analysis, provided the City with results, and will generate a USGS report later in 2016. In March 2016, the City developed a report of the 2015 monitoring results and submitted the report to IDEQ, EPA and IFCAP. The October 2015 Mercury Fish tissue sampling reports are summarized below and include:

Fish tissue mercury concentrations were lower than concentrations measured in 2013 for all sites monitored.

The collected fish species remained the same between years for all sites except for Brownlee Reservoir; smallmouth bass were collected in 2013 and channel catfish in 2015.

The results of the 2015 fish tissue monitoring show compliance with the 0.3 mg/kg methylmercury criterion at all six of the monitored sites.

The Boise River at Parma and Brownlee Reservoir at Burnt River have active IFCAP Fish Consumption Advisories for mercury (IDH&W, 2015). Idaho Health and Welfare issued a fish consumption advisory in July 2012 for catfish at Parma based on elevated fish tissue levels.

The 2015 geomean concentrations for the Boise River at Parma and Brownlee Reservoir at Burnt River were 0.22 and 0.18 mg/kg, respectively.

The Idaho Department of Environmental Quality adopted EPA's recommended fish-tissue criterion (0.3 mg/kg) and a reasonable potential to exceed (RPTE) threshold 20 percent lower than the criterion, or greater than 0.24 mg/kg, based on an arithmetic average concentration of 10 fish from a receiving waterbody[5].

NPDES permitted discharge to waters with fish having mercury concentrations exceeding 0.24 mg/kg are determined to have a reasonable potential to exceed the water-quality criterion and thus are subject to additional permit obligations, such as requirements for increased monitoring and the development of a Mercury Minimization Plan.

All 2015 fish tissue mercury concentrations were less than 0.24 mg/kg at all monitored locations.

Water column total mercury concentrations were higher at the three Boise River monitoring sites compared to 2013 values. In contrast, concentrations at the two Snake River monitoring sites were lower in 2015 compared to 2013 and the Brownlee Reservoir water column mercury concentration was significantly lower in 2015 compared to 2013 (8.78 vs. 0.71 ng/L).

All water column concentrations are below the aquatic life water column criteria of 12 ng/L.

The City has been entered agreements with two wastewater permittees, the City of Caldwell and the Star Water and Sewer District, as participants in the watershed based fish tissue sampling effort. Each City has pending NPDES permits that require conducting fish tissue sampling independently or as part of a watershed based monitoring effort. The modest cost for Cities to participate are derived by a per capita population basis.

[5] IDEQ, 2005, Implementation Guidance for the Idaho Mercury Water Quality Criteria, 212p, IDEQ, Boise, ID, https://www.deq.idaho.gov/media/639808-idaho_mercury_wq_guidance.pdf; accessed March 2016.

Figure 1: Location of Boise WWTF Instream Monitoring Locations

XIII. Recordkeeping

The permit requires the City to retain records and make those records available to the regulatory agencies and public.

The City retains records of all data and information used in the development and implementation of the SWMP. All records are stored electronically or in hard copy for at least five years. All records are accessible to the IDEQ or EPA upon request and to the public by filing a Public Information Request with the City.

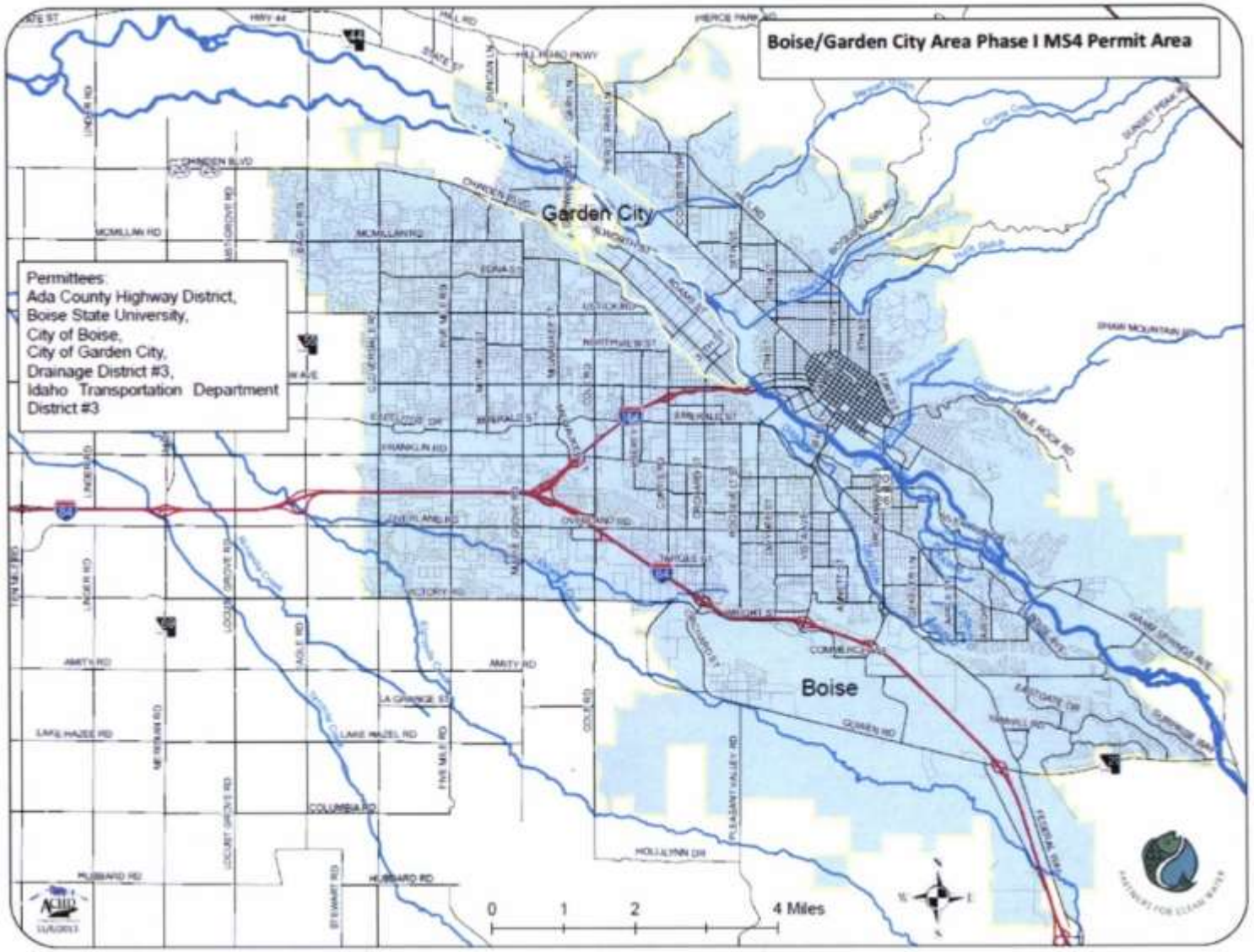
XIV. Reporting Requirements and Addresses

The permit has annual reporting requirements for monitoring, water quality and fish tissue sampling, and a coordinated annual report of all permittee SWMP activities by ACHD.

The City will continue to develop and submit annual reports that include all permit required data, information, updates, and schedules for all SWMP elements and information necessary to meet the requirements identified in Part II.C.3 of the permit.

Reports and other documents require by this permit will be signed in accordance with Part VI.E and submitted to IDEQ and EPA at the addresses identified in Section IV.D of the permit.

Appendix A: 2015 Boise/Garden City MS4 Map



Appendix B: 2013 Boise/Garden City MS4 Co-Permittee Intergovernmental Agreement

http://www.partnersforcleanwater.org/media/172345/2013-intergovernmental-agreement.pdf

Appendix C: City of Boise References

Stormwater Management Ordinance (Boise Municipal Code, Chapter 8-15)

http://cityclerk.cityofboise.org/media/223712/13588_0815.pdf

Construction Site Erosion Control Ordinance (Boise Municipal Code, Chapter 8-17)

http://cityclerk.cityofboise.org/media/223722/0817.pdf

Stormwater Management: A Design Manual (September 2015)

http://www.partnersforcleanwater.org/media/186286/stormwaterdesignmanual2015_1_.pdf

Stormwater: Boise City Non-Stormwater Disposal Management Practices (June 2006)

http://publicworks.cityofboise.org/media/219227/22375_StormwaterNon-stwaterDisposalBMPGuidebook.pdf

Boise City Stormwater Operations and Maintenance - A Resource Guide

http://publicworks.cityofboise.org/media/218887/oandmhandbookrev2010.pdf

Stormwater Plant Materials Selection - A Resource Guide

http://publicworks.cityofboise.org/media/218892/10105_PlantGuideline.pdf

Appendix D: Boise/Garden City MS4 Permit

http://www.epa.gov/region10/pdf/permits/npdes/id/ids027561_ms4_fp_2012.pdf

Appendix E: SWMP Effectiveness Assessment for Pollutants of Concern

Assessment of SWMP Controls at Improving Receiving Water Quality

Permittees are required to evaluate and measure the effectiveness of the Storm Water Management Plan (SWMP) to control the discharge of pollutants of concern (II.C.3); ensure that discharges from the MS4 will not cause or contribute to applicable Idaho water quality standards; and annually assess the success of SWMP controls at improving receiving water quality (IV.C.3.iii).

The City of Boise owned portions of the Municipal Separate Storm Sewer System (MS4) are very limited (total of 11 outfalls to the Boise River or tributaries of the Boise River from short sections of Park roadways and parking lots, the Main Library! parking lot, Fire Training Center, etc.) that discharge to the Boise River. The Boise City MS4 also includes fire stations, libraries, an airport, and other properties that retain storm water on site and do not directly discharge to surface waters. In extreme events, some of these sites may discharge to the Ada County Highway District MS4. The assessment of SWMP controls on receiving water section provides information on the receiving water quality of the Boise River for the four pollutants of concern and a comparison of the receiving stream water quality to applicable Idaho water quality standards and Total Maximum Daily Load (TMDL) targets for the duration of the MS4 program history.

The data used in this analysis have been collected using representative sampling methods, quality assurance and control, and 40 CFR 136 methods developed for sampling and monitoring associated with the Boise wastewater National Pollutant Discharge Elimination System (NPDES) permits. The permits require upstream/downstream monitoring for City of Boise's Lander Street and West Boise Water Renewal Facilities.

Boise River sampling locations used to evaluate and assess SWMP effectiveness at improving water quality include Veteran's Parkway Bridge (RM 50.2) and Glenwood Bridge (RM 47.5). Both locations are in the lower portion of the MS4 which extends on both sides on the Boise River for approximately 12 river miles, from Barber Dam (RM 57.5) to the head of Eagle Island (RM 45.5).

The permit identifies four pollutants of concern: sediment, total phosphorus, bacteria (*E. coli*) and temperature. Lower Boise River Total Maximum Daily Loads (TMDLs) have been developed and approved by EPA for three pollutants, sediment, bacteria (IDEQ, 1999) and total phosphorus (2015); and is anticipated in the future for temperature.

C.1 Sediment

The Lower Boise River Sediment TMDL established Total Suspended Sediment (TSS) targets of 50 mg/l for no more than 60 days and 80 mg/l for no more than 14 days; a critical period of February 15-June 14; a Load Allocation of 37% reduction for the drains and tributaries below Middleton; a Wasteload Allocation for current discharges; and a reserve for growth.

The sediment TMDL anticipated the issuance of the Boise/Garden City MS4 permit would result in reduced TSS and phosphorus loads of 26-27% due to implementation of BMPs (e.g. construction erosion controls, new and redevelopment design standards for on-site retention or/and water quality treatment, and infrastructure management (e.g. sweeping, inspection, cleaning)) and that would be sufficient to meet sediment TMDL needs.

TSS data are collected monthly at Veteran's and Glenwood Bridges as required by wastewater permits issued in 1999 and re-issued in 2012. This allows for assessment of the MS4 SWMP sediment control performance over the 2000-present period. The original Boise/Garden City MS4 permit was issued in November 2000. Construction erosion and new and redevelopment on site retention ordinances, design manuals, and programs were developed and implementation began during the early years of the permit cycle, therefore the data from the first three years can reasonably be used as a baseline representative of pre-permit implementation water quality.

All observed TSS concentrations in the lower portion of the MS4 area are significantly below the Lower Boise TSS TMDL targets during the period 2000-2016 (Figure E1). The observed 2016 TSS levels at Veteran's Bridge was significantly lower than 2015 values. This was expected due to the contributing/exacerbating factors in WY2015 that diminished in 2016. In 2015, thunderstorms in the Middle Fork and South Fork Boise River drainages caused landslides on forest lands burned in recent years. In addition, a week long flow surge (300-400 cfs) in the South Fork Boise River below Anderson Ranch Dam occurred at the same time. The flow surge was an effort to improve fish habitat by removing fine sediment related to the recent forest fires. The Glenwood Bridge 2016 observed sediment levels were slightly lower in 2016 than in 2015 for similar reasons. The decreased TSS levels in 2016 are likely due to return to pre-fire contributing/exacerbating conditions and not related specifically to MS4 practices.

Annual average concentrations have been calculated for each location to assess MS4 performance and pollutant trend. Annual average TSS concentrations have decreased at both the Veteran's and Glenwood Bridge locations over the period of MS4 program implementation (Figure E3). Comparison of the annual average TSS concentrations at Veteran's and Glenwood (first three years vs. last three years for similar/median flow years) show modest decreases in the annual average TSS reduction. The 2014 fires and associated increased TSS in the Boise River at the monitoring locations in WY2015 appear to be fire and precipitation related and well below the water quality standard. The WY2015 concentrations do not appear to be

representative of MS4 performance due to the influence of the 2014 fires and associated sediment rich runoff in the upper portions of the watershed.

The receiving stream data suggest that implementation of the MS4 sediment controls over the 1999-2016 timeframe suggests that the MS4 has not contributed to exceedance of water quality standards or TMDL targets.

Figure E1: Boise River at Veteran's Bridge Monthly TSS data January 2000-September 2016

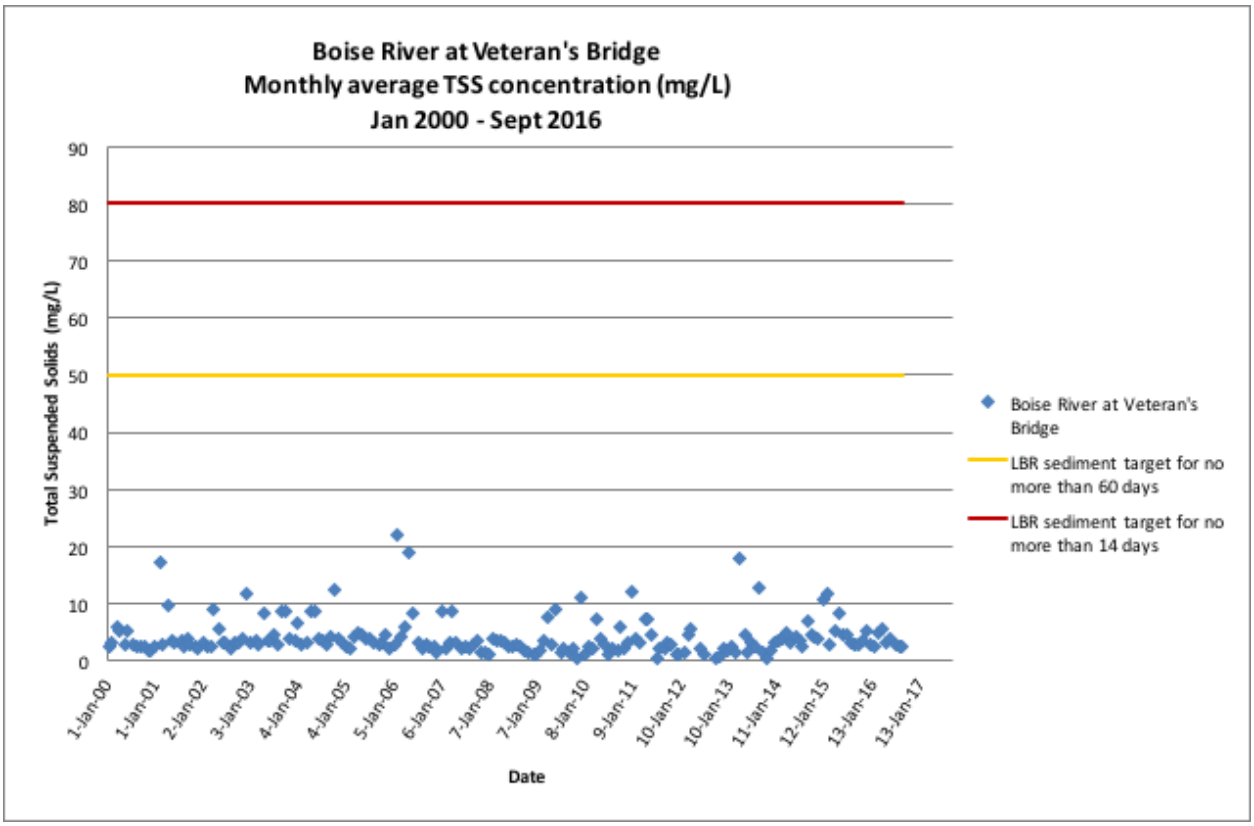


Figure E2. Boise River at Veteran's Bridge Monthly TSS data WY2016

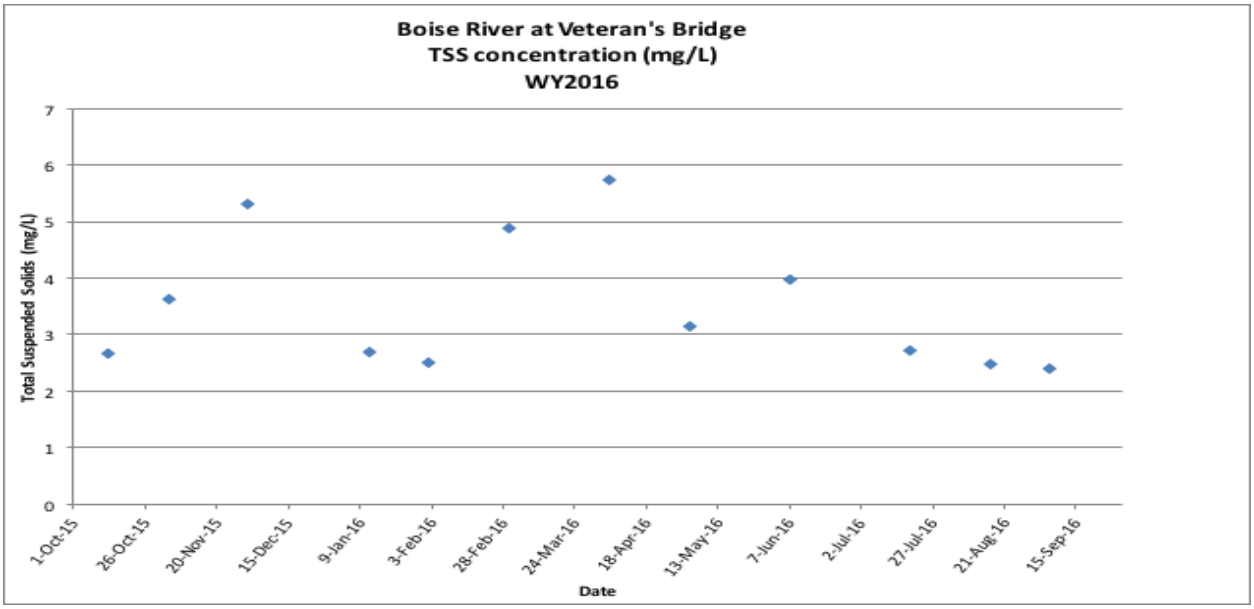
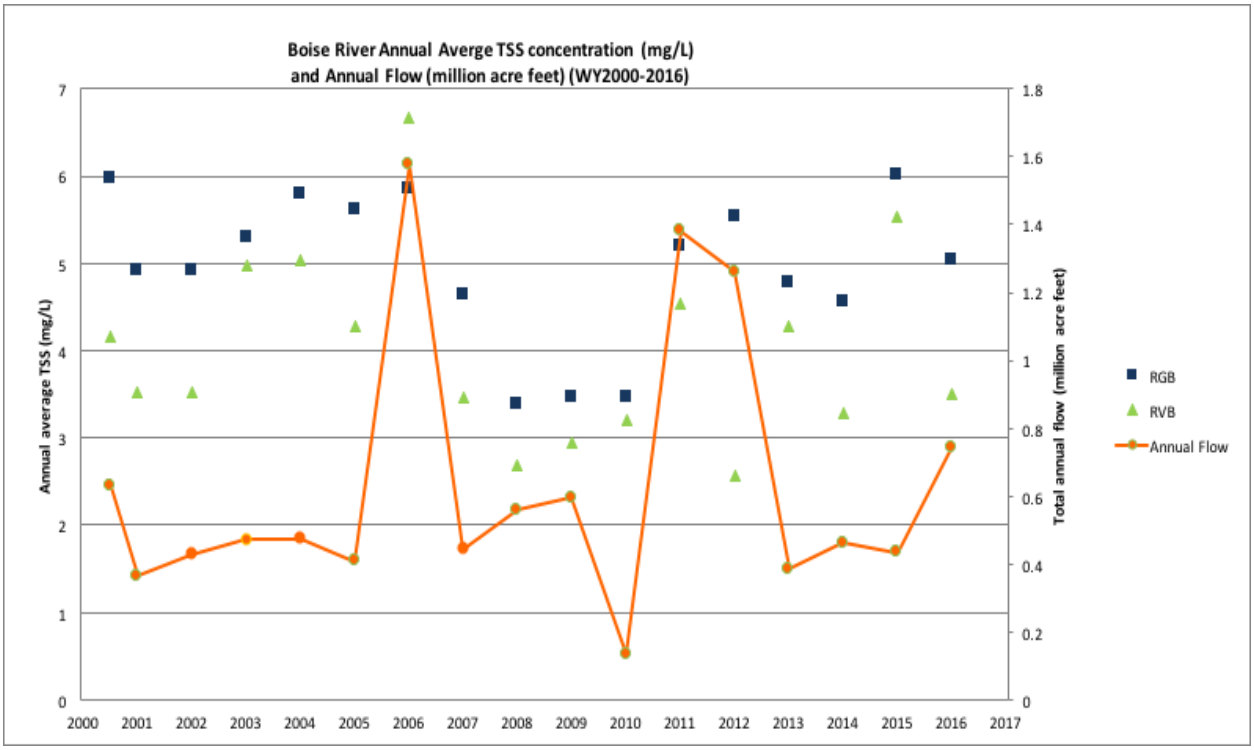


Figure E3: Boise River Annual Average TSS at Veteran's and Glenwood Bridges FY2000-2016



C.2 Bacteria

The Lower Boise River Bacteria TMDL (IDEQ, 1999) established primary and secondary contact fecal coliform targets and anticipated the adoption of new Idaho *E. coli* recreational water quality criteria (30 day 126 coliform forming units (CFU)/100 ml). *E. coli* criteria were adopted by the state in 2000. In 2012, EPA recommended new recreational water quality criteria for adoption by states (126 CFU/100 ml 30 day geomean and a 410 CFU/100 ml 30-day Statistical Threshold Value (STV)). The STV approximates the 90th percentile of the water quality distribution and should not be exceeded more than 10 percent of the samples taken.

The TMDL sub-basin assessment found the standard was met in the mainstem Boise River through town and that the tributaries were the primary source of bacteria contributions. The TMDL required reductions of 92-99% from eleven tributaries from Eagle Drain to Dixie Drain and was silent concerning stormwater.

E. coli data are collected monthly at Veteran's and Glenwood Bridges as required by NPDES wastewater permits issued in 1999 and 2012. One individual sample in WY16 had a concentration above 126 CFU/100 ml at Glenwood and two at Veteran's Bridge (Figure E4). One value at Veteran's Bridge suggests that the monthly average may have exceeded the geometric mean criteria of 126/ CFU/100 ml. 2000-2016 values rarely exceed the EPA 410 ST 8) and did not exceed it in WY16 (Figure E5).

The City of Boise initiated a weekly sampling effort on the Boise River at five locations (Eckert Road to Eagle Bridge) April 2003 – October 2004 to determine if the river met the 30 day geomean criterion. The results of the weekly sampling showed that the *E. coli* criterion (126 CFU/100 ml 30 day geomean) was met during the entire sampling period, including two summer and one winter/spring seasons. Subsequent monthly sampling shows similar *E. coli* levels, which suggests the Boise/Garden City MS4 is not causing or contributing to exceedance of the E. coli recreational water quality standard (126 CFU/100 ml 30 day geomean) or the 2012 EPA recommended water quality standard (126 CFU/100 ml 30 day geomean and 410 CFU/100 ml STV) in the MS4 reach.

Figure E4: Boise River at Veteran's and Glenwood E. coli Bacteria: WY2016

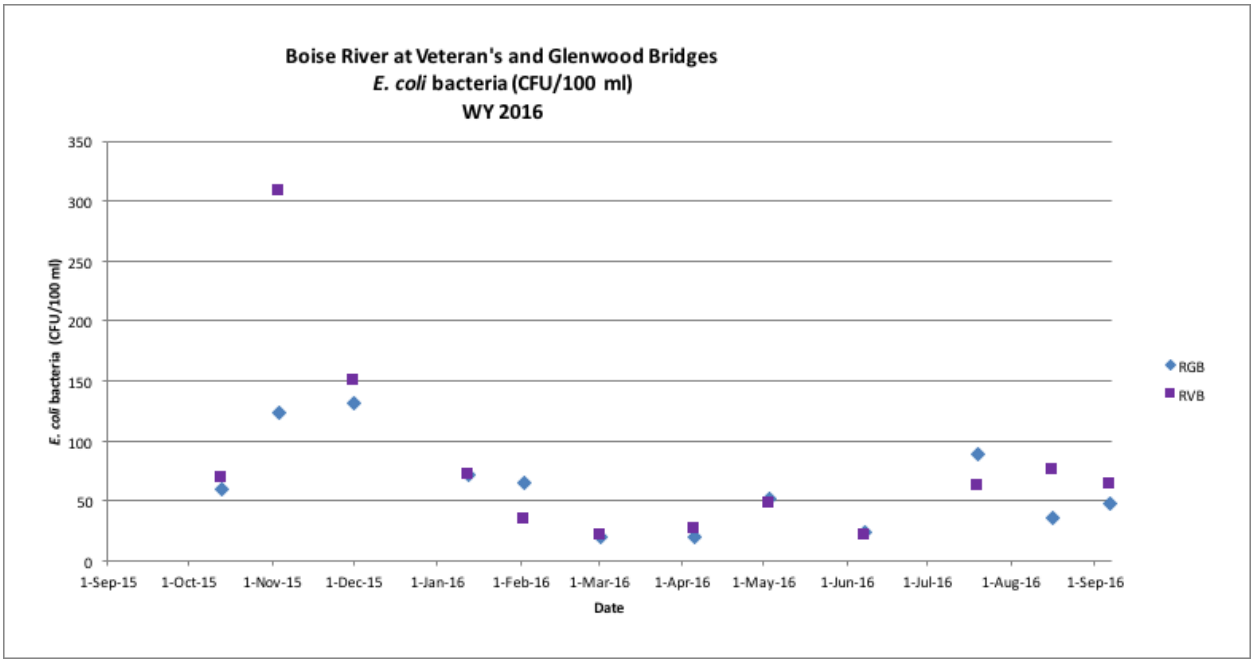
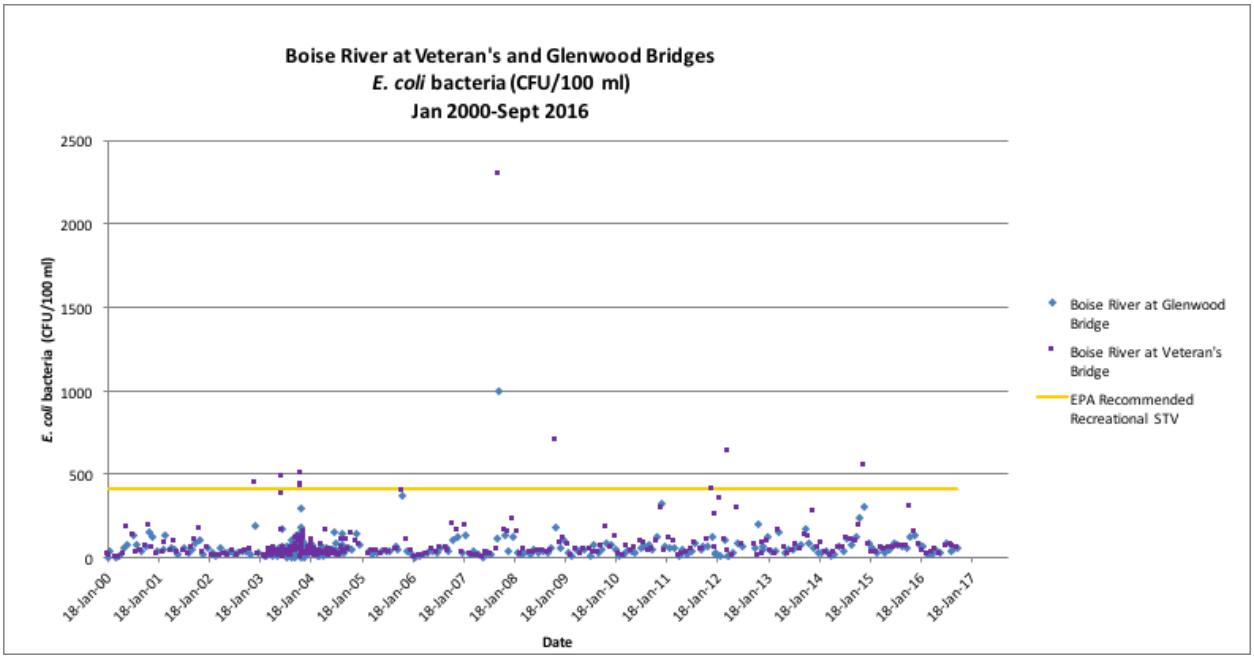


Figure E4: Boise River at Veteran's and Glenwood E. coli Bacteria: 2000-2016



C.3 Total Phosphorus

The Lower Boise River TMDL Total Phosphorus Addendum was approved by EPA in December 2015. The final phosphorus TMDL addendum was based on concurrently meeting the downstream Snake River Hells Canyon (SR-HC) Total Phosphorus TMDL target approved in 2004, and the instream aesthetic periphyton targets for the Lower Boise River (150 mg/m^2) year round. The SR-HC TP TMDL provides a seasonal (May-September) 70 ug/l TP target for Lower Boise river inflow to the Snake River at Parma. The Lower Boise River Phosphorus TMDL was developed to address aesthetic impairment from Middleton (RM24) to the mouth of the Boise River and addressed all sources downstream of Lucky Peak Dam (RM64). The Phosphorus TMDL Addendum includes a 42% reduction goal for stormwater discharges in the watershed. The phosphorus TMDL included no reserve for growth for point and non-point sources, with growth coming from meeting the target at the point of discharge or through a combination of trading and implementation of BMPs to accommodate future growth.

The Boise River is a tailwater stream below Lucky Peak Dam, with limited nonpoint and point source inputs except stormwater above Veteran's Bridge. Below Veteran's, the Lander Street Water Renewal Facility discharges to the Boise River, including a significant TP concentration (historically 400-6,000 ug/l) and volume (15 million gallons per day) on a seasonal basis, complicating the TP dynamics at Glenwood. The current Lander NPDES permit has interim effluent TP limits of 1.0 mg/l TP as a monthly average May 1 through September 30 for each year until the final effluent limit is reached (2022).

The Veteran's and Lucky Peak annual TP concentrations are very stable. There is a very small increase in TP concentration as the river flows through the first eight miles of the MS4 and essentially all values are well below the TMDL target at the mouth of 70 ug/l. Monthly TP data have been collected since 1999 and annual average TP concentrations have been calculated for the Veteran's Bridge location. Due to the significant load from the Lander Water Renewal Facility, only Veteran's Bridge data were used to assess SWMP effectiveness.

SWMP effectiveness for TP can typically be assessed using comparing the first three and last three years of data of similar flow. However, WY2014 and WY2015 TSS and TP values are skewing this comparison. The annual Boise River trend for TP over the period 2000-2016 (excluding WY14 and WY15) is decreasing, which can be accounted for by SWMP related reduction of sediment (e.g. 2 lbs. TP/ton of sediment) due to implementation of construction erosion controls, improved street sweeping, public education efforts on fertilizer use and voluntary removal of phosphorus from residential fertilizers by major fertilizer companies.

WY2016 weekly TP data for Veteran's are shown in Figure E6, 2000-2015 weekly TP data are in Figure E7 and annual average TP data are shown in Figure E8. Total phosphorus concentrations are elevated in the Boise River at Veteran's Bridge from the middle of August through October 2014 and the first half of the water year 2015 (October 2014-May 2015) due to fires and

summer thunderstorm runoff for 2014 and primarily rain at low elevations and snow and rain on snow at higher elevations during the winter and spring of 2014-2015. The observed values are 3-4 times the observed TP concentration from the historical record and appear to be related to the ongoing impacts of the 2014 wildfires on increased TSS and TP due to increased runoff in the fire impacted areas of the upper watershed. The trendline figure (Figure E9) shows that WY2014 and WY2015 are outliers, with essentially identical TP annual average concentrations and weekly TP data at 3-4 times the observed long term TP concentration in the summer and winter immediately after the fires in the upper watershed. Figure E10 is the average annual TP concentration for the Boise River at Veteran's Bridge 2000-2016, excluding WY14 and WY15. This demonstrates the decreasing TP concentration in the Boise River at this location.

Figure E6: Boise River Weekly Total Phosphorus Concentrations at Veteran's Bridge, WY2016

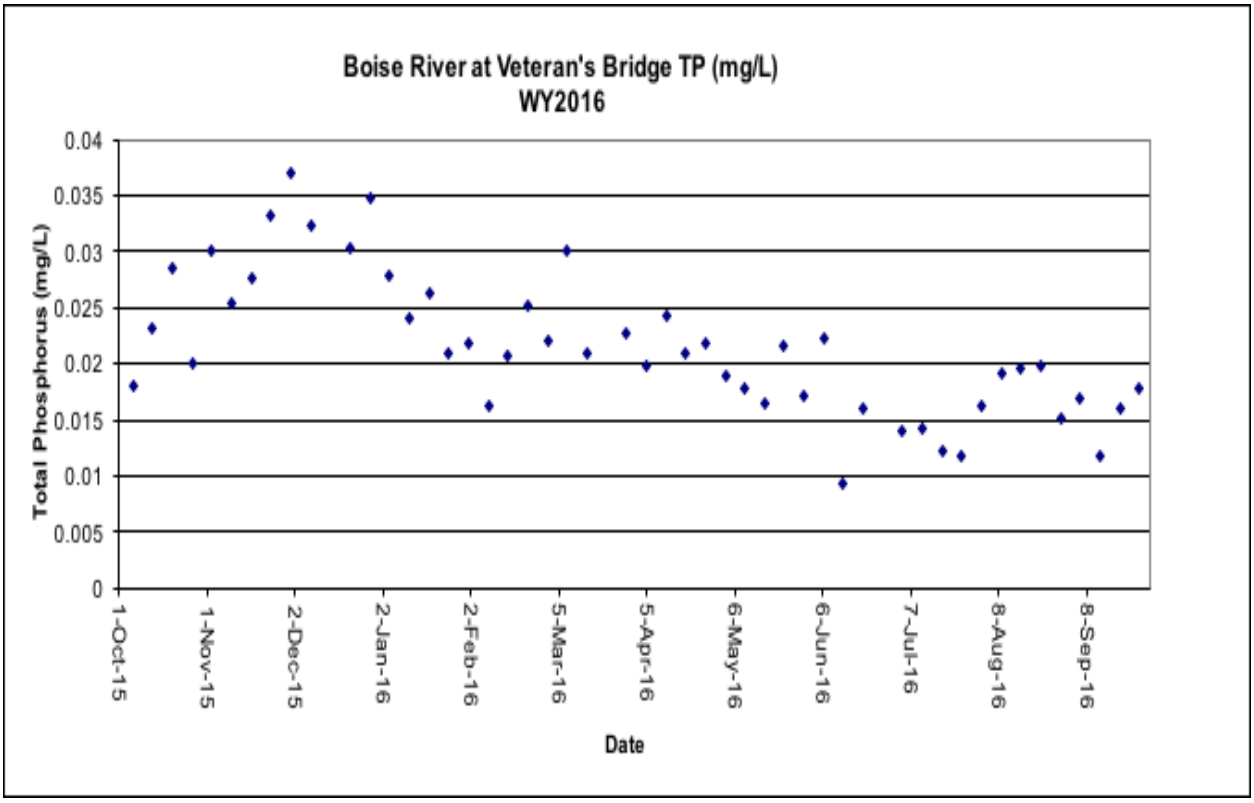


Figure E7: Boise River Weekly TP at Veteran's Bridge: 2000-2016

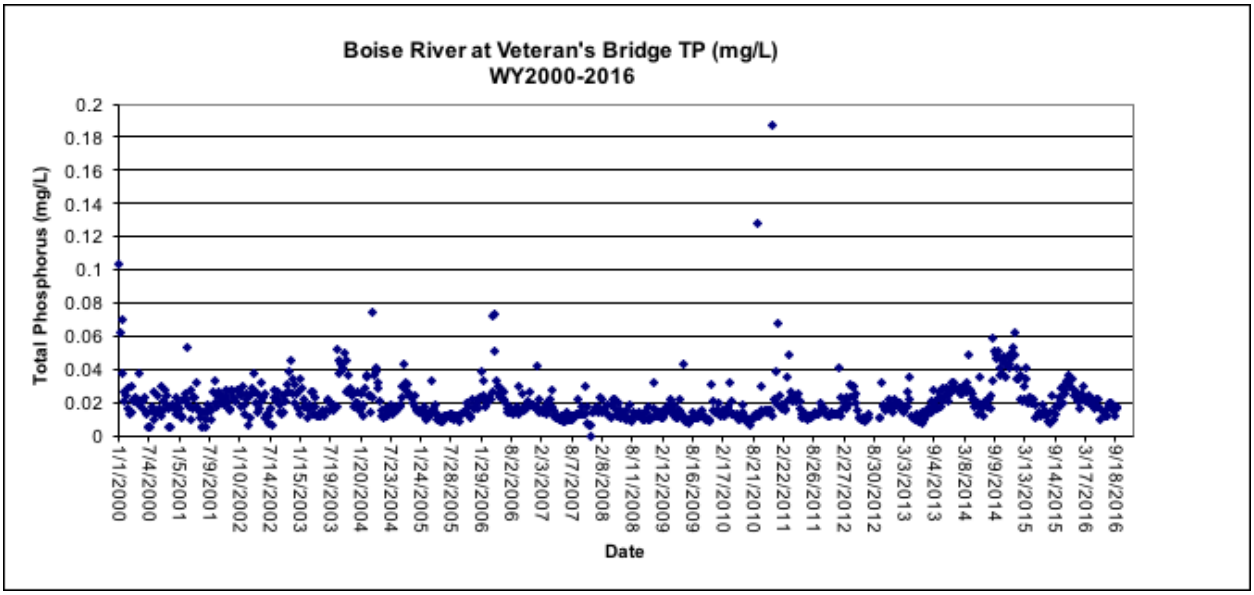


Figure E8: Boise River Annual Average TP at Veteran's Bridge: 2000-2016

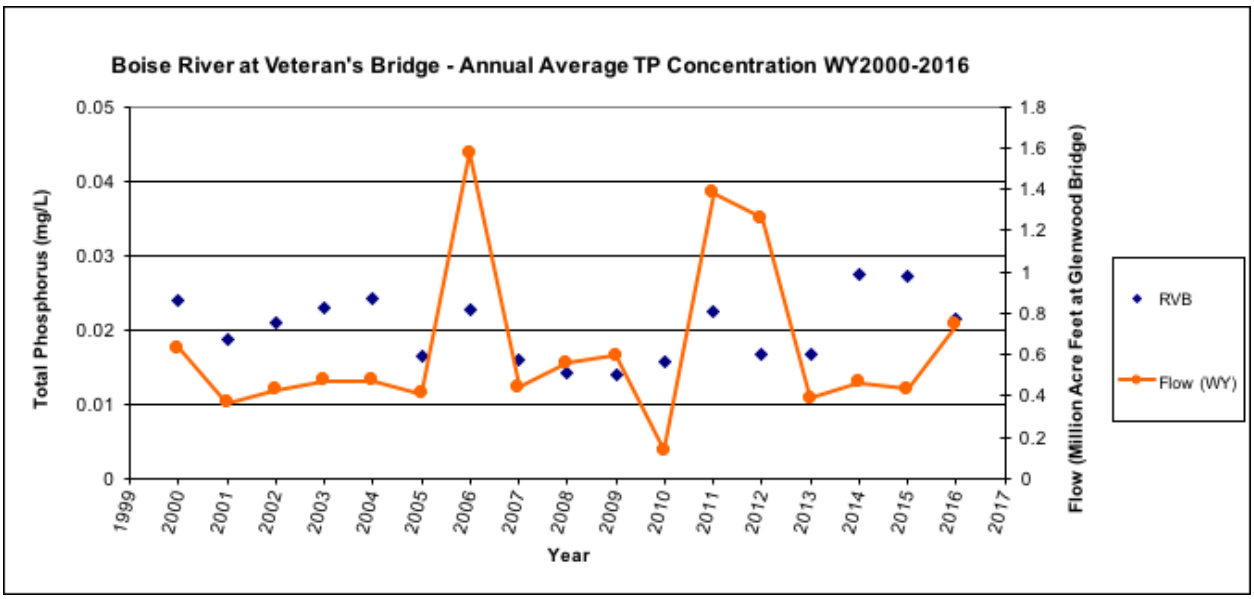


Figure E9: Boise River at Veteran's Bridge – Annual Average TP Trend (all years)

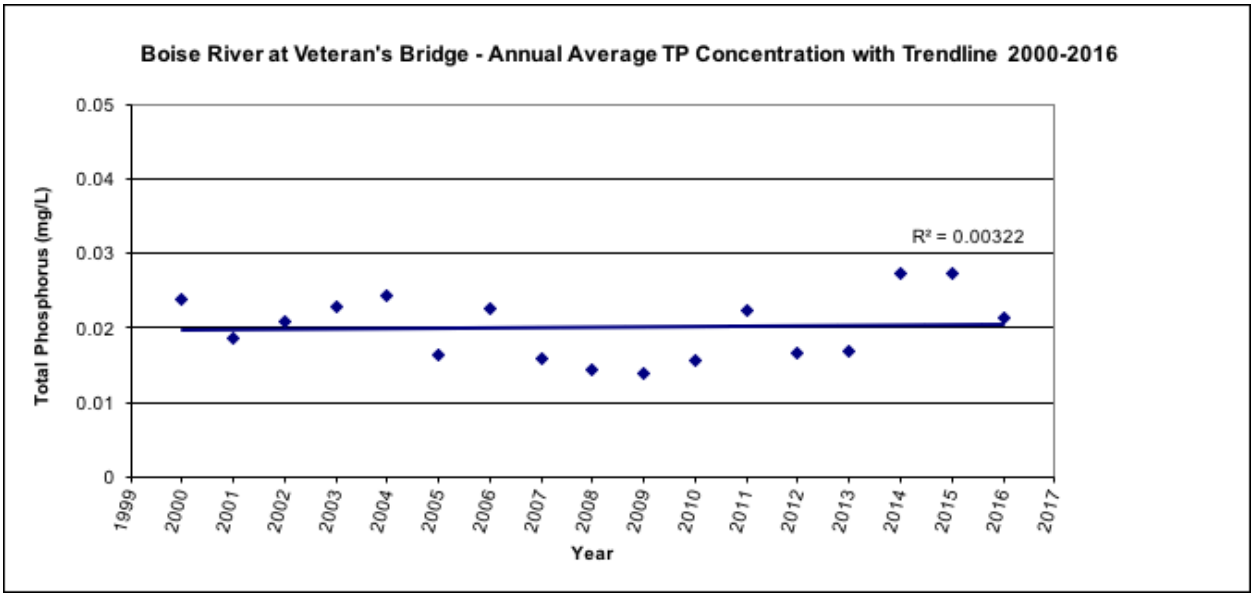
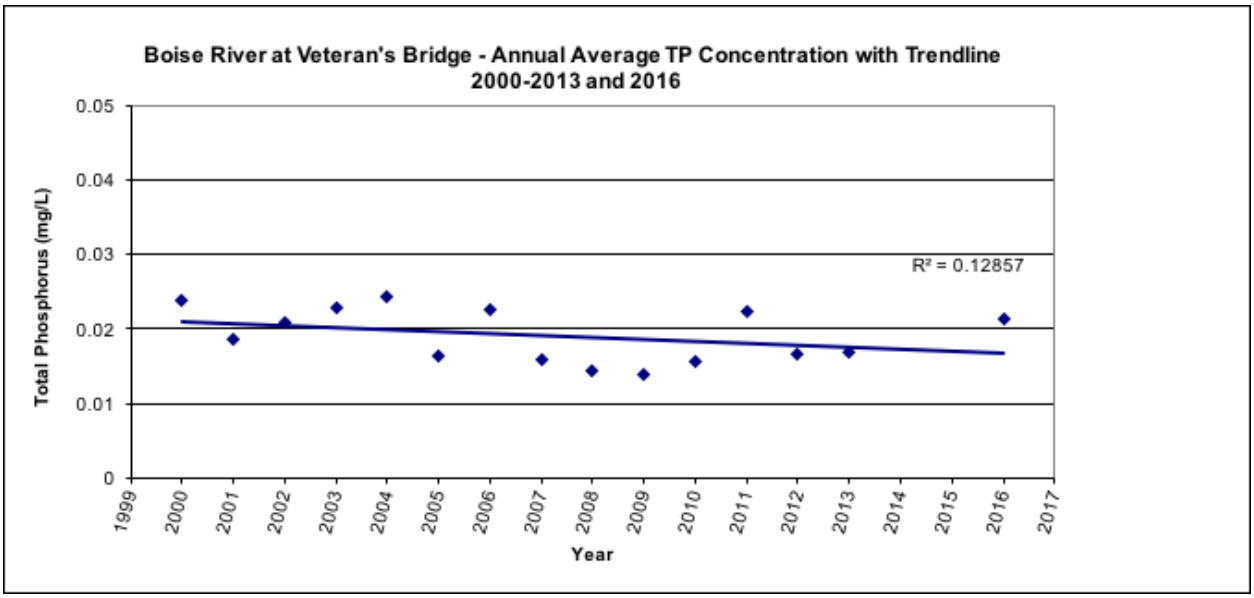


Figure E10. Boise River at Veteran's Bridge – Annual Average TP trend (excluding WY14 and WY15).



C.4 Temperature

The Boise River is listed for temperature from Veteran's Bridge to the mouth. In 2016, the City of Boise submitted comments as well as supporting monitoring and modeling data on the IDEQ draft Integrated Report recommending the delisting of the Boise River assessment unit from Veteran's Bridge to Star Bridge for temperature. The City has collected 15-minute water temperature data from a series of Lower Boise sites, including Veteran's and Glenwood Bridges, since 1999 using continuous temperature recorders and IDEQ Protocols. The data are quality controlled and assured using USGS methods and provide sufficient data to calculate daily maximum, daily average, and maximum weekly maximum temperatures that are the associated criterion associated with the designated uses of the reach of the river the MS4 discharges to. The temperature criterion for salmonid spawning is 13°C maximum weekly maximum temperature (MWMT) and is in effect from November 1 – May 30. The cold water aquatic life criterion of 19°C daily average (DA) and 22°C daily maximum (DM) are in effect from June 1-October 31.

Veteran's and Glenwood temperature data from 1999-2016 and WY2016 are shown in Figures 11-14. Compliance with the salmonid spawning criterion (13°C MWMT) at both locations is significant as shown in Table E1. Details for WY2016 are shown in Table E2. Note that the CWAL criteria are in effect from June 1 – October 31, but the report summarizes the WY data (10/1 – 9/30).

Table E1: Boise River Compliance with Temperature WQS at Glenwood and Veteran's Parkway November 1999- October 2016

November 1999-October 2016			BOISE RIVER AT GLENWOOD BRIDGE			BOISE RIVER AT VETERAN'S BRIDGE		
USE	**CRITERION**	**PERIOD**	**DAYS IN COMPLIANCE**	**PERCENT COMPLIANCE**	**EXCEEDANCE MAGNITUDE**	**DAYS IN COMPLIANCE**	**PERCENT COMPLIANCE**	**EXCEEDANCE MAGNITUDE**
SALMONID SPAWNING	13°C MWMT	November-May	3223 of 3287	98.1%	1.7°C	3328 of 3354	99.2%	1.1°C
COLD WATER AQUATIC LIFE	19°C MDAT	June-October	2497 of 2572	97.1%	1.4°C	2529 of 2573	98.3%	1.0°C
COLD WATER AQUATIC LIFE	22°C MDMT	June-October	2569 of 2572	99.9%	0.1°C	2570 of 2573	99.9%	0.1°C

Table E2: Boise River Compliance with Temperature WQS at Glenwood and Veteran's Bridges WY2016

WY2016 (10/1/15-9/30/16)			BOISE RIVER AT GLENWOOD BRIDGE			BOISE RIVER AT VETERAN'S BRIDGE		
USE	**CRITERION**	**PERIOD**	**DAYS IN COMPLIANCE**	**PERCENT COMPLIANCE**	**EXCEEDANCE MAGNITUDE**	**DAYS IN COMPLIANCE**	**PERCENT COMPLIANCE**	**EXCEEDANCE MAGNITUDE**
SALMONID SPAWNING	13°C MWMT	November-May	207 of 207	100%	0°C	207 of 207	100%	0°C
COLD WATER AQUATIC LIFE	19°C MDAT	June-October	122 of 122	100%	0°C	122 of 122	100%	0°C
COLD WATER AQUATIC LIFE	22°C MDMT	June-October	122 of 122	100%	0°C	122 of 122	100%	0°C

Exceedances of the temperature water quality criterion within the MS4 reach are rare, short duration, and low magnitude. There are many consecutive years experiencing no exceedances of cold water aquatic life or salmonid spawning criterion.

The most significant exceedances of the cold water aquatic life water quality standard(s) occur, (e.g. 2001, 2013) in the August and September timeframes when little, if any, discharge from the MS4 is occurring. Temperature and precipitation data suggest that discharges from the MS4 are not the cause of observed water quality exceedances and do not cause or contribute to exceedances of temperature water quality standards at levels that warrant additional controls on City of Boise MS4 structures or practices.

Figure E11: Veteran's Temperature 1999-2016

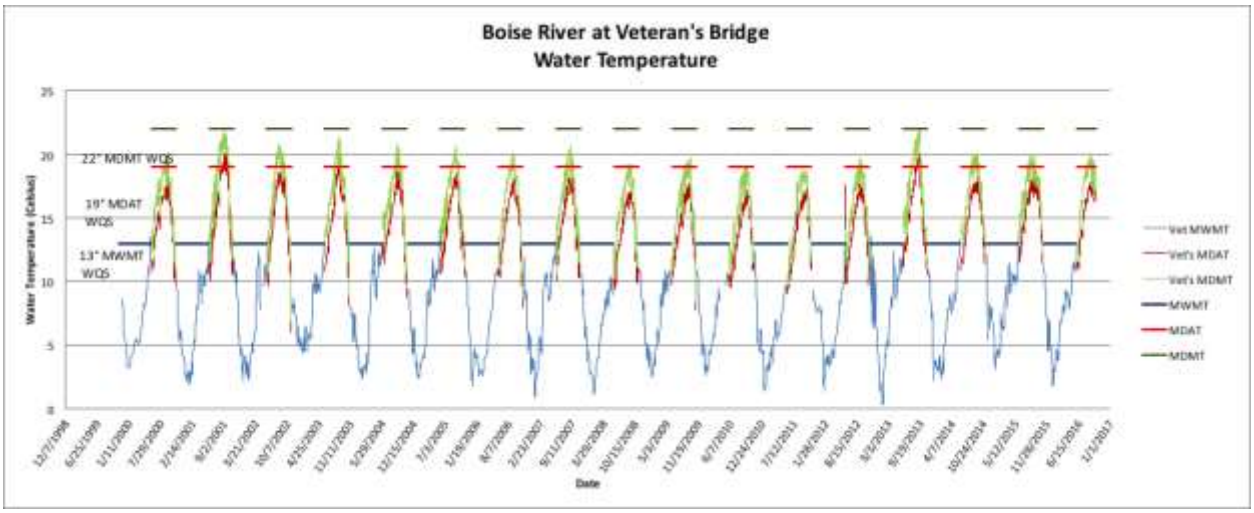


Figure E12: Veteran's Temperature WY2016

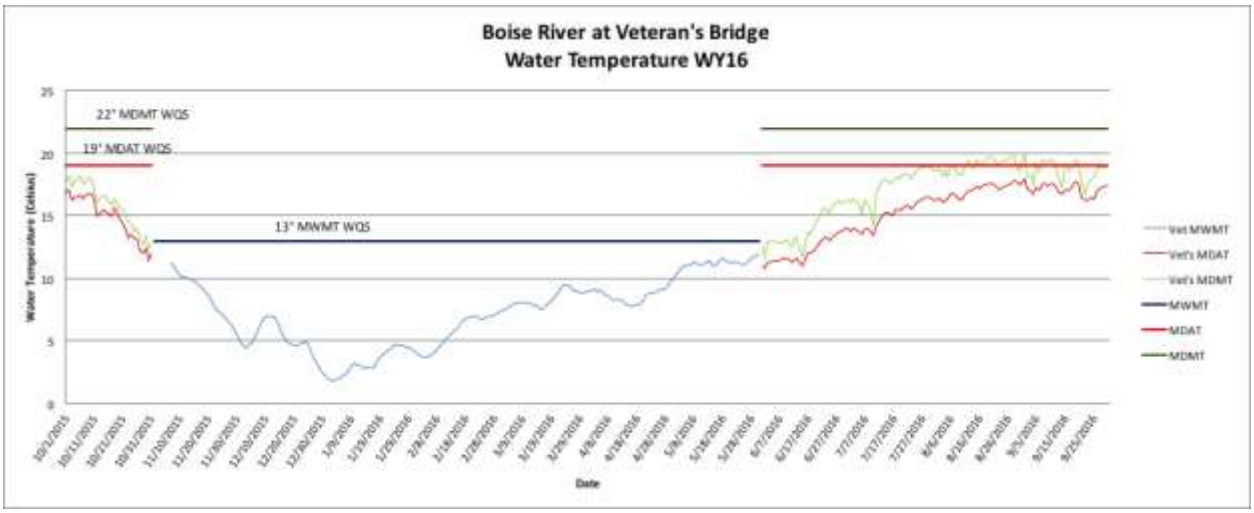


Figure E13: Glenwood Temperature 1999-2016

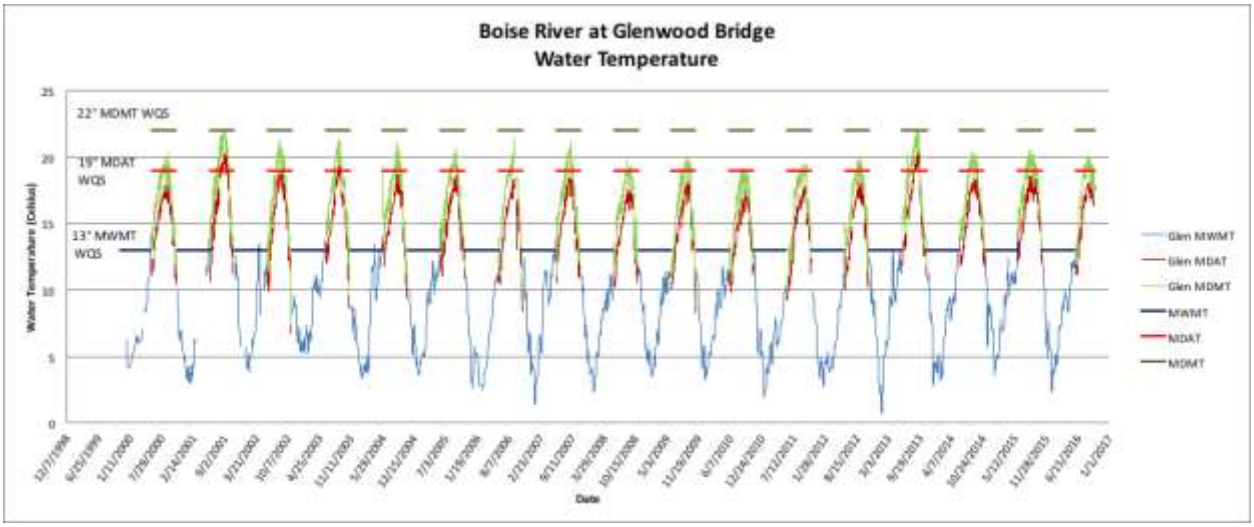
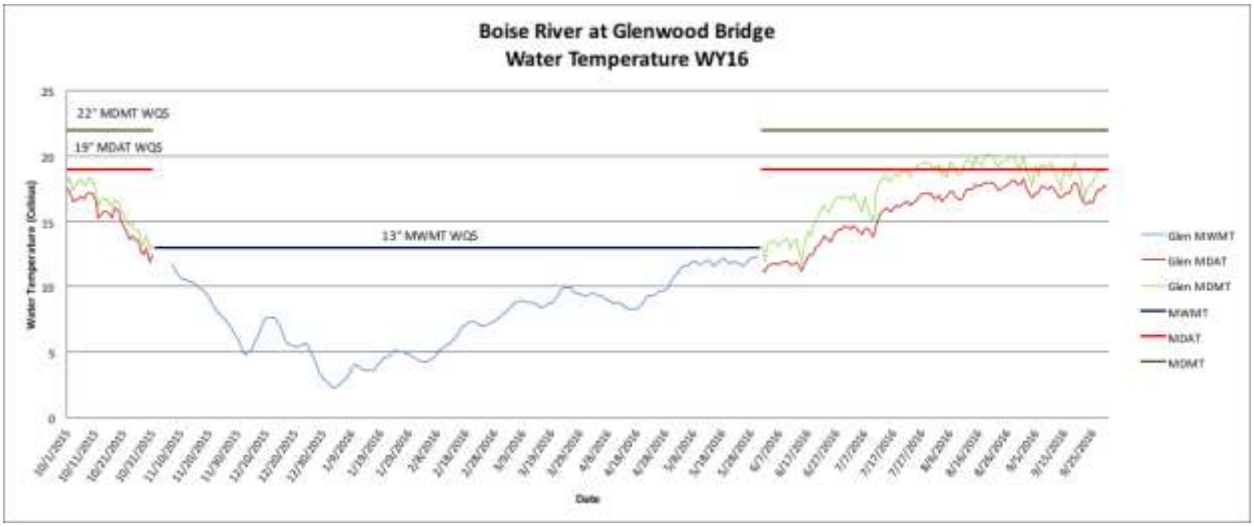


Figure E14: Glenwood Temperature WY2016



Appendix F: City of Boise Stormwater Program Team Distribution List

The City of Boise Stormwater Management Program document has been distributed to all City departments and divisions with stormwater management obligations. The distribution list includes:

1. Boise City Public Works
    a. Haley Falconer, Boise City Environmental Manager
    b. Robbin Finch, Boise City Water Quality Environmental Program Manager
    c. Aimee Hughes
    d. Steven Hubble
    e. Terry Alber
    f. Scott Canning
    g. Rob Bousfield, P.E. Boise City Assistant City Engineer
    h. Jim Pardy, P.E. Boise City Engineer
    i. Steve Burgos, Director of Public Works
2. Boise City Parks and Recreation
    a. Jennifer Tomlinson
    b. Doug Holloway, Director of Parks and Recreation
3. Boise City Airport
    a. Matt Petaja, P.E.
    b. Jill Singer
4. Boise City Planning and Development Services/Housing and Community Development
    a. Erosion and Sediment Control Staff
    b. Glen Kellerer, Housing and Community Development
    c. Derick O'Neil, Director, Boise City Planning and Development Services
5. Boise City Library
    a. Kevin Booe, Director, Boise City Library!
    b. Denise McNeley