Finding of No Significant Impact

Final Environmental Assessment

Maintenance and Rehabilitation of Spillway and Dam Structures at American Falls Dam, Minidoka Project, Power County, Idaho

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Snake River Area Office

PN FONSI # 19-4

Introduction

The Bureau of Reclamation (Reclamation) has prepared this Finding of No Significant Impact (FONSI) to comply with the Council of Environmental Quality (CEQ) regulations for implementing procedural provisions of the National Environmental Policy Act (NEPA). This document briefly describes the proposed action, other alternatives considered, the scoping process, Reclamation's consultation and coordination activities, mitigation, and Reclamation's finding. The Final Environmental Assessment (EA) fully documents the analyses of the potential environmental effects of implementing the changes proposed.

Location and Background

The Minidoka Project (Project) was authorized by the Secretary of the Interior in 1904 and was the first Reclamation project constructed in Idaho. It is located in the Snake River Basin in the southeastern part of the state. American Falls Dam, completed in 1927, is a 94-foot-high composite concrete and earth gravity-type dam on river mile 714.7 of the Snake River near American Falls, Idaho. With a storage capacity of 1,700,000 acre-feet, American Falls Reservoir is the largest reservoir of the Project. The dam itself is located in Power County, Idaho, but the reservoir stretches northeast into both Bingham and Bannock Counties. American Falls Dam and Reservoir comprise a multi-purpose facility from which principle benefits include irrigation, power generation (through a powerplant owned and operated by Idaho Power), flood control, fish and wildlife resources, and recreation.

A core-drilling program in the early 1960s revealed that the concrete in portions of the dam was in a relatively advanced stage of deterioration due to a chemical reaction between alkalis in the cement and the aggregate. This type of reaction, unknown at the time of construction, resulted in a significant loss in strength and durability, threatening the competence of the dam and resulting in a fill restriction that reduced the storage capacity of the reservoir to about 66 percent of its maximum design capacity. By congressional act of December 28, 1973, the American Falls

Reservoir District, acting as the constructing agency representing the storage spaceholders, was authorized to finance and contract for the replacement of American Falls Dam. Construction was completed in 1978 and the original structure was demolished. Reclamation repaid the District, acquired title, and assumed responsibility for operations and maintenance after completion of the dam.

In 1976, Idaho Power Company built the current hydroelectric powerplant at the dam, which consists of three generators that are authorized by the Federal Energy Regulatory Commission (FERC) to produce 92.4 megawatts of hydroelectricity. Idaho Power generates hydroelectricity at this American Falls Dam powerplant when sufficient head conditions allow, generally from the end of March through mid-October.

Purpose and Need

The purpose of the proposed action is to improve the structural integrity of the American Falls Dam spillway to avoid further deterioration, which could lead to serious structural deficiencies, and to provide a more feasible means of access for future maintenance activities.

The current cracked and damaged state of concrete on the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin floor structures creates this need for action. These concrete components of the dam structure are exhibiting significant deterioration, cracking, and spalling, and require repair. Minor repairs have been completed to the spillway face throughout its lifetime, including an overlay of the stilling basin floor that was completed in 1978 to repair damaged concrete after the initial spill season. However, over the ensuing 40 years of service, these structures have undergone ongoing deterioration. A Value Engineering Study was completed in September 2015 that recommended the following corrective actions: removal and replacement of 6 inches of concrete on the spillway face and stilling basin floor; repair of concrete on the upper spillway gate operator decks (referred to as “pier decks” in these recommendations); and complete replacement of the spillway adits (access entryways).

Alternatives Considered and Recommended Action

The range of alternatives developed for this proposed action is based on the purpose and need for the project, and the issues raised during internal, external, and Tribal scoping and meetings with representatives from the Idaho Department of Environmental Quality (IDEQ) and Idaho Department of Fish and Game (IDFG). The alternatives analyzed include a no-action alternative and the recommended action. The recommended action consists of maintenance and rehabilitation construction activities to cut, remove, and replace existing damaged concrete and reinforcing on the spillway, pier deck, and stilling basin structures. In addition, it would include replacement or modification of an existing drain grate. The no-action alternative does not meet the defined purpose and need for action, but was evaluated because it provides an appropriate basis by which the recommended action is compared.

Summary of Environmental Effects

The following summarizes the effects the Proposed Action (Alternative B) would have on each resource category analyzed in the EA. For a full analysis and explanation of how each resource was evaluated, readers may reference Chapter 3 – Affected Environment and Environmental Consequences in the EA.

Hydrology

Effects include the short-term, temporary operational limitation to water passage configurations at American Falls Dam due to dewatering of the stilling basin during construction periods. Discharges through the powerplant would be continued for a 6 week period in October to November of 2020 and 2021, instead of being routed through the stilling basin at the conclusion of irrigation season (October 15) as in typical operations. Approximately 38,000 additional acre-feet (af) of water would be discharged from American Falls Reservoir over a 6 week period in October and November of 2020 and 2021. The water would be recaptured in previously-vacated storage space in Lake Walcott. Lake Walcott, which typically is maintained at a constant full pool elevation, would experience a brief, minor (approximately 5 feet) drawdown in the late summers of 2020 and 2021 and would then refill to normal full pool levels by the end of November in both years. Overall seasonal drawdown to American Falls Reservoir would still be dependent upon climactic conditions. Overall water management approach and timing and magnitude of water deliveries would remain within the historic range of operations. There would be no long-term effects to hydrology resulting from implementation of Alternative B. Effects to hydrology from this proposed action are not expected to contribute to cumulative effects.

Water Quality

Effects include potential wind deposition of construction debris in American Falls Reservoir and contaminant mobilization and transport into the Snake River below American Falls Dam due to construction activity in the waterway. These would be minimal due to implementation of construction industry best management practices (BMPs). Increased sediment mobilization could occur if American Falls Reservoir is drawn down below 100,000 af. If stochastic climactic conditions (e.g., hot, dry conditions, specific wind conditions, periods of cloud cover) cause reduced dissolved oxygen (DO) concentrations during the in-waterway construction period, lowered DO in the Snake River below the dam could be prolonged due to a delayed ability to initiate spill as a mitigative measure.

Preventative measures would be expected to mitigate potential effects to DO to an insignificant level. These preventative measures include the following:

- Operating American Falls Reservoir to target specific seasonal levels;
- Ongoing water quality monitoring and real-time reporting by IDEQ to predict trends of decreasing DO; and

- The placement and use of additional aerators below the dam as advised by an interdisciplinary interagency water quality advisory team.

Use of aerators to raise DO concentrations could result in elevated total dissolved gas (TDG) concentrations in the Snake River below the dam, but, this risk would be minimized through monitoring, real-time reporting, and adaptive management based on observed trends in water quality conditions. Effects to water quality would be temporary, and limited to the in-waterway construction period (August to November) of 2020 and 2021. There would be no long-term effects to water quality resulting from implementation of Alternative B. Effects to water quality from this proposed action are not expected to contribute to cumulative effects.

Aquatic Resources (Fisheries)

Effects include potential reductions in prey base, changes in the level of fish entrainment through American Falls Dam and Minidoka Dam, and seasonal migration barriers to adfluvial fish due to reservoir drawdowns. The likelihood of these effects rising to a significant level would be minimized via preventative early-season water level management in American Falls Reservoir to maintain target water storage levels above those at which measurable effects to fish populations would be likely to occur. There would be no long-term effects to aquatic resources resulting from implementation of Alternative B. Effects to aquatic resources from this proposed action are not expected to contribute to cumulative effects.

Noise

Effects include short-term, temporary increase in noise disturbance limited to the localized area of construction activity and the areas immediately adjacent to the construction site. This effect would be limited to working hours during the construction periods. There would be no long-term effects to noise levels resulting from implementation of Alternative B. Effects to noise from this proposed action are not expected to contribute to cumulative effects.

Recreation

Effects include short-term, temporary disturbance to recreational visitation during the construction periods. Equipment staging would limit access to parking at the West Wall, which would limit the availability of the west side beach at American Falls during the construction periods. This limitation to public access would be limited in duration to the construction period, after which all previous public access would be restored; therefore, effects would not be significant. There would be no long-term effects to recreation resulting from implementation of Alternative B. Effects to recreation from this proposed action are not expected to contribute to cumulative effects.

Transportation

Effects include minor general increases to local traffic in and around the City of American Falls due to construction traffic during the proposed project. Closures of westbound State Highway (SH)-39 would occur from July through November in both construction years, with all traffic rerouted to the eastbound lanes and two-way traffic limited to one lane each for approximately 2 miles. Oversized vehicle travel would be limited to designated times during the construction periods. Effects to traffic configurations would be temporary. There would be no long-term effects to transportation resulting from implementation of Alternative B. Effects to transportation from this proposed action are not expected to contribute to cumulative effects.

Socioeconomics

Effects include short-term, minor economic gains to the local area due to revenue from construction and contracting services. There would be no long-term effects to socioeconomics resulting from implementation of Alternative B. Effects to socioeconomics from this proposed action are not expected to contribute to cumulative effects.

Unaffected Resources

The Proposed Action would not cause any short- or long-term direct, indirect, or cumulative effects to the following resource categories:

- Threatened and Endangered (T&E) species
- Indian trust assets
- Indian sacred sites
- Cultural resources
- Environmental justice

Environmental Commitments and Mitigation

Mitigation measures for effects to water quality are detailed in a Draft Water Quality Restoration Plan, the most current draft of which is an appendix to the EA (Final EA Appendix D).

Mitigation to noise exposure for employees on-site during construction would follow Section 8 of Reclamation's Safety and Health Standards general requirements to reduce employee noise exposure to acceptable levels as needed.

To guide recreationist access, during construction signs would be posted providing recreationists project information and maps showing the availability of recreation opportunity alternatives outside the affected area.

Consultation, Coordination, and Public Involvement

In compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended in 1992), Reclamation consulted with the Idaho State Historic Preservation Office to identify cultural and historic properties in the area of potential effect. Consultation was initiated in April 2017, and the State Historic Preservation Office concurred with the finding of no adverse effect to historic properties that same month (Final EA Appendix F).

Reclamation mailed Tribal and public recipients scoping letters with a project information package enclosed on November 16, 2018, and November 21, 2018, respectively (Final EA Appendix F and H). No response comments were received.

Reclamation conducted multiple interagency and affected stakeholder meetings and teleconferences for information sharing and coordination purposes during planning and development of the proposed action in 2018, which included participants from the IDEQ, IDFG, and Idaho Power Company, detailed in Table 1. A Draft EA was provided to IDFG and IDEQ for comment on April 5, 2019, and agency comments were incorporated into the Final EA.

Table 1. Agency and stakeholder meetings conducted during EA planning and preparation.

Meeting Date	Involved Parties	Issues discussed
4/30/2018	Reclamation, Idaho Power	Overall project overview, cooperative operations, initial water quality concerns
8/13/2018	Reclamation, Idaho Power	Dissolved oxygen, additional water quality concerns, and operational mitigative strategies
11/7/2018	Reclamation, IDEQ	Water quality concerns, monitoring, and mitigation strategies
11/16/2018	Reclamation, Idaho Power	Operational considerations, water quality concerns, and mitigation
11/19/2018	Reclamation, IDEQ, IDFG	Water quality concerns, compliance strategies, water system management, and fisheries concerns

Reclamation issued a press release in May 2019 to announce the pending publication of the Final EA on or about May 20, 2019.

Finding

Based on the analysis of the environmental effects presented in the Final EA and consultation with potentially affected agencies, tribes, organizations, and the general public, Reclamation concludes that implementation of the proposed action will not have a significant impact on the quality of the human environment or natural and cultural resources. The effects of the proposed action will be minor, temporary, and localized. Therefore, preparation of an Environmental Impact Statement (EIS) is not required.

Decision

Based on the analysis in the EA, it is my decision to select for implementation the Proposed Action (Alternative B). The Proposed Action will best meet the Purpose and Need identified in the EA.

Recommended:

5/20/2019

Amy Goodrich
Natural Resources Specialist
Snake River Area Office, Boise, Idaho

Date

Approved:

5/20/2019

Roland K. Springer
Snake River Area Manager
Pacific Northwest Region, Boise, Idaho

Date

RECLAMATION
Managing Water in the West

Environmental Assessment

Maintenance and Rehabilitation of Spillway and Dam Structures at American Falls Dam

Minidoka Project, Power County, Idaho

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Snake River Area Office
Boise, Idaho

May 2019

U. S. DEPARTMENT OF THE INTERIOR

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

BUREAU OF RECLAMATION

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Cover Photograph: American Falls Dam, Power County, Idaho. Photo courtesy of James Beitz.

Acronyms and Abbreviations

APE	Area of Potential Effects
BMP	Best Management Practice
Census Bureau	United States Census Bureau
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted sound level
DO	Dissolved oxygen
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impacts
GVW	Gross vehicle weight
Idaho Power	Idaho Power Company
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Labor
IPaC	Information for Planning and Conservation
ITAs	Indian Trust Assets
ITD	Idaho Transportation Department
MUTCD	U.S. Department of Transportation's Manual on Uniform Traffic Control Devices
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
Project	The Minidoka Project
Reclamation	Bureau of Reclamation
SH	State Highway
TDG	Total Dissolved Gas

TMDL	Total Maximum Daily Load
TP	Total phosphorous
TSS	Total suspended solids
USFWS	United States Fish and Wildlife Service

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Chapter 1 Purpose and Need

1.1 Introduction

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA). This EA analyzes the potential environmental effects that could result from the proposed construction activities necessary for the maintenance and rehabilitation of the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin structures at American Falls Dam. The proposed project would consist of the cutting, removal, and replacement of existing damaged concrete and reinforcing. In addition, it would include reinforcement and replacement or modification of an existing drain grate.

This EA serves as a tool to aid the authorized official in making an informed decision that is in conformance with applicable Federal laws and regulations. The Proposed Action and Alternatives are described in Chapter 2 of this document, and the effects (direct, indirect, and cumulative environmental effects) of each alternative are evaluated for each of the affected resource areas in Chapter 3 of this document.

The NEPA process requires analysis of any Federal action that may have an impact on the human environment. This EA is being prepared to assist Reclamation in finalizing a decision on the proposed action, and to determine whether to issue a Finding of No Significant Impact (FONSI) or a notice of intent to prepare an environmental impact statement.

1.2 Background, Location, and Action Area

The Minidoka Project (Project) was authorized by the Secretary of the Interior in 1904 and was the first Reclamation project constructed in Idaho. American Falls Dam, completed in 1927, is a 94-foot-high composite concrete and earth gravity-type dam on river mile 714.7 of the Snake River near American Falls, Idaho. With a storage capacity of 1,700,000 acre-feet, American Falls Reservoir is the largest reservoir of the Project. The dam itself is located in Power County, Idaho, but the reservoir stretches northeast into both Bingham and Bannock Counties (Figure 1). American Falls Dam and Reservoir comprise a multipurpose facility from which principle benefits include irrigation, power generation (through a powerplant owned and operated by Idaho Power Company), flood control, fish and wildlife resources, and recreation (Reclamation 1995).

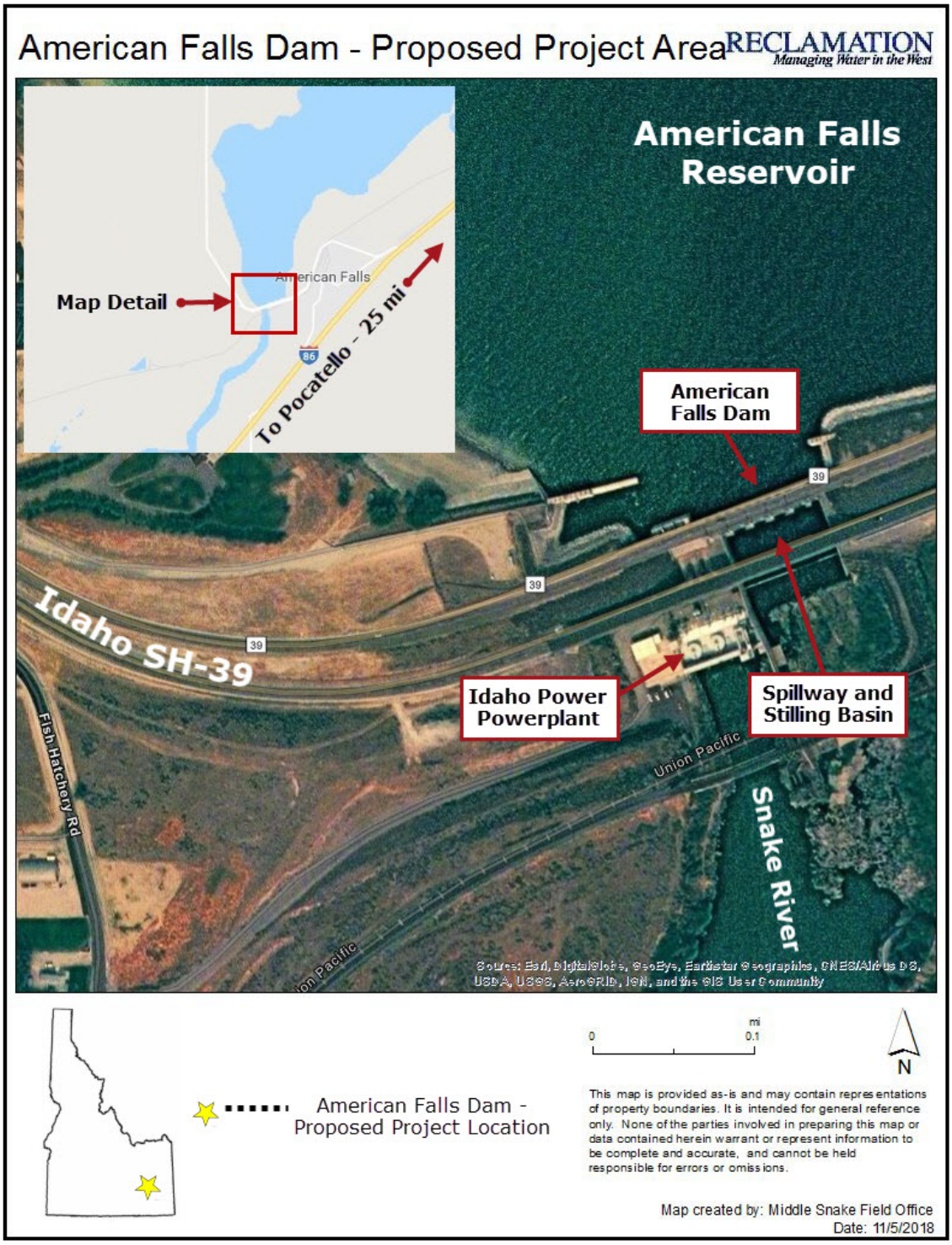

Figure 1. Map of proposed project location with project area detail.

A core-drilling program in the early 1960s revealed that the concrete in portions of the dam was in a relatively advanced stage of deterioration due to a chemical reaction between alkalis

in the cement and the aggregate. This type of reaction, unknown at the time of construction, resulted in a significant loss in strength and durability, threatening the competence of the dam and resulting in a fill restriction that reduced the storage capacity of the reservoir to about 66 percent of its maximum design capacity. By a congressional act dated December 28, 1973, the American Falls Reservoir District (acting as the constructing agency representing the storage spaceholders) was authorized to finance and contract for the replacement of American Falls Dam. The dam replacement was completed in 1978 and the original structure was demolished. After completion of the dam, Reclamation repaid the American Falls Reservoir District, acquired title, and assumed responsibility for operations and maintenance of the dam.

In 1976, the Idaho Power Company (Idaho Power) built the current dam's hydroelectric powerplant, which consists of three generators authorized by the Federal Energy Regulatory Commission (FERC) to produce 92.4 megawatts of hydroelectricity (FERC 2018). When sufficient head conditions allow, Idaho Power generates hydroelectricity at this powerplant, generally from the end of March through mid-October.

American Falls Reservoir and associated Reclamation-administered lands are operated to accommodate a wide variety of resource needs in accordance with existing Federal laws and Reclamation policy. However, the primary operation strategy is storage of water for irrigation of lands. Cooperative agreements have been signed with other agencies and organizations for programs focused on control of erosion and enhancement of wetlands and other wildlife habitat. Local jurisdictions and organizations have leased Reclamation lands to develop and operate recreational facilities. Project operations are monitored and evaluated to provide resource management that provides the greatest benefit within statutory and policy guidelines (Reclamation 1995).

1.3 Purpose and Need for Action

The purpose of the proposed action is to improve the structural integrity of the American Falls Dam spillway to avoid further deterioration, which could lead to serious structural deficiencies. In addition, the proposed action would provide a more feasible means of access for future maintenance activities.

The current cracked and damaged state of concrete on the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin floor structures is the impetus for this action. These concrete components of the dam structure are exhibiting significant deterioration, cracking, and spalling and they require repair. Minor repairs have been completed to the spillway face throughout its lifetime, including an overlay of the stilling basin floor completed in 1978 to repair damaged concrete after the initial spill season. However, over the ensuing 40 years of service, these structures have undergone ongoing deterioration. A Value Engineering Study was completed in September 2015, which recommended the following corrective actions: removal and replacement of 6 inches of concrete on the spillway face and stilling basin floor; repair of concrete on the upper spillway

gate operator decks (referred to as “pier decks” in these recommendations); and complete replacement of the spillway adits (access entryways). Visual examples of the current state of deterioration are pictured in Figure 2 through Figure 4.

Figure 2. Disintegrating surface concrete observed on the dam face (circled).

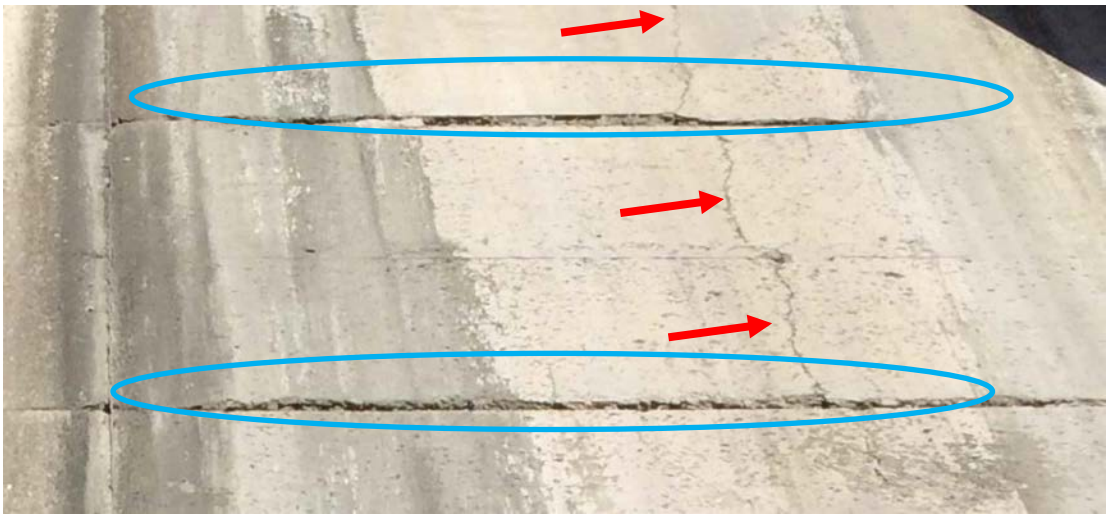

Figure 3. Deterioration of concrete joints observed on the spillway face (circled). Vertical cracking (marked with red arrows) is also visible.

Figure 4. Structural deterioration of concrete observed on spillway gate operator deck 2. Extensive exposed aggregate is apparent (circled).

1.4 Authorities

The Minidoka Project was authorized by the Secretary of the Interior under the Reclamation Act of 1902 on April 23, 1904. Specific to power production, the authority to accept funding from the Bonneville Power Administration for power provided is granted under Section 2406 of P.L. 102-486, the Energy Policy Act of 1992, which was signed on October 24, 1992.

1.5 Regulatory Compliance

The following major laws, executive orders, and secretarial orders apply to the proposed action and compliance with their requirements is documented in this EA:

- National Environmental Policy Act
- Endangered Species Act (ESA)
- National Historic Preservation Act (NHPA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Executive Order 13007 Indian Sacred Sites
- Executive Order 12898 Environmental Justice
- Executive Order 13175 Consultation and Coordination with Tribal Governments
- Secretarial Order 3175 Department Responsibilities for Indian Trust Assets (ITAs)
- Secretarial Order 3355 Streamlining National Environmental Policy Act Reviews and Implementation of Executive Order 13807, “Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects”

1.6 Scoping Summary

The scoping process for the draft EA provides an opportunity for the public, governmental agencies, and Tribes to identify any issues they may have with the proposed project and to ensure a full range of potential alternatives were proposed to meet the purpose and need stated in this document. To accomplish this, Reclamation (1) provided information to the public through local media in the form of press releases, (2) mailed preliminary information to and solicited comments from potentially affected Tribes, and (3) met with local, state and Federal agencies. Details regarding Tribal, public, and agency scoping are included in Chapter 4.

Chapter 2 Description of Alternatives

2.1 Introduction

This chapter describes the alternatives analyzed in this EA—Alternative A: No Action Alternative and Alternative B: Proposed Action.

2.2 Alternative Development

The alternatives presented in this chapter were developed based on the purpose and need for the project, as described in Chapter 1, and the issues raised during internal, external and Tribal scoping. The alternatives analyzed in this document include the no action alternative and the proposed maintenance and rehabilitation construction activities to cut, remove, and replace existing damaged concrete and reinforcing on the spillway, pier deck, and stilling basin structures, and replacement or modification of an existing drain grate. A no action alternative is evaluated because it provides an appropriate basis by which the other alternative is compared.

Prior to the initiation of this EA process, Reclamation held several formal and informal multi-agency meetings and conference calls with representatives of the Idaho Department of Environmental Quality (IDEQ) and the Idaho Department of Fish and Game (IDFG) to solicit input and guidance regarding completion of the proposed maintenance. Analysis and mitigation of specific concerns raised in these meetings related to the missions of these agencies (i.e., fisheries, water quality) have been incorporated into this EA. Also, prior to initiation of the EA process, Reclamation entered into discussions with Idaho Power. These discussions identified a range of potential operating agreements that would be mutually agreeable and feasible to facilitate the completion of maintenance work. The agreements considered multiple external constraints such as, budget, timeframe, facility/equipment capabilities, and environmental commitments.

During the scoping process, several timing and project duration scenarios were presented in communications with Idaho Power and informally evaluated in terms of financial/logistical feasibility and potential environmental effects. The scenarios included 1, 2, and 3-year project durations, and seasonally earlier or later in-waterway construction start dates. No substantively new alternatives were identified during the scoping process.

2.3 Alternative A – No Action

2.3.1 American Falls Dam Water Release Configurations

Water released from American Falls Dam flows into the Snake River by two routes (or a combination): (1) Through penstocks that pass through the dam structure and feed into the

powerplant owned by Idaho Power, which then discharges it directly into the river channel, or (2) Through spillway gates and/or the regulating gates on the dam that discharge into the stilling basin, which then overflows into the river channel once it is filled (identified in Figure 1).

The powerplant at American Falls Dam is capable of passing a maximum of 15,000 cubic feet per second (cfs). The minimum flow needed for hydropower generation is 1,000 cfs. Idaho Power halts hydropower production when flows drop below 1,000 cfs, typically at the end of irrigation season (typically on or around October 15th). Although it is possible for the powerplant to pass up to 2,400 cfs at "speed no load[1]" (without generating power), standard dam operations are to cease all releases through the powerplant at the end of the irrigation season, and all water is then passed through the stilling basin until power generation resumes in the spring.

Water passing through the stilling basin may come through the upper radial gates, or through lower-level gates on the dam structure (regulating gates), but is all broadly referred to as "spill." Regardless of which gates are used, in order for spilled water to reach the river channel downstream, the stilling basin must first fill completely. Because the maximum powerplant discharge is 15,000 cfs, passage of flows above 15,000 cfs requires the use of spill. Flows from either of the two routes (powerplant or spill) converge approximately 1,000 feet downstream from the dam.

2.3.2 Water Operations Considerations

Under normal operations, water releases at American Falls Dam generally adhere to the following operational guidelines[2]:

Irrigation season (April through September): Irrigation releases are determined by the diversion demands at Minidoka and Milner Dams. All flows are passed through the powerplant, except in the rare events that the powerplant is offline, the capacities of the powerplant and outlet works are exceeded, or low dissolved oxygen (DO) downstream from the dam necessitates the use of spill to aerate the discharged water. River changes are formally called in to Idaho Power and the powerplant operator makes the required changes. Normal flows are 12,000 to 13,000 cfs and are typically adjusted through the irrigation season to maintain Lake Walcott (above Minidoka Dam) at a constant elevation of 4,245 feet. In the late irrigation season, minor drawdown of Lake Walcott in preparation for winter can also be used to meet some downstream irrigation demand.

[1] "Speed no load," also referred to as "full speed no load" or FSNL, is a power generation configuration where one or more turbines are in operation (spinning), but no power generation load is applied. In hydrogeneration, speed no load operation generally occurs at startup, or at times when power demand is low, but continued water passage is desired. Due to the potential for equipment damage, it is generally undesirable to maintain a speed no load configuration for an extended timeframe.

[2] Formal flood control rule curves have not been developed for American Falls Reservoir; therefore, there is no formally designated amount of minimum space that must be maintained for flood control. However, American Falls is generally operated with the goal of limiting discharge from Minidoka Dam to less than 20,000 cubic feet per second (cfs).

Winter (October through March): The Idaho Power powerplant requires a minimum flow of 1,000 cfs to generate power. As a result, the powerplant typically stops power generation mid-October when releases from the dam are reduced to winter flows. All flows are then passed through the regulating gates and into the stilling basin. The water becomes aerated through turbulence in the stilling basin and then overflows into the Snake River downstream from the dam once it is filled. There is no official minimum winter release, but an unofficial minimum release of 300 cfs in the non-irrigation season is generally targeted in consideration of benefits to fish and wildlife. IDFG prefers that Reclamation maintain post-irrigation fall releases above 2,000 cfs until November 1st to prevent over-harvest of fish in the reach downstream from American Falls. In years when releases during this timeframe must be reduced to 1,000 cfs or less, IDFG may close fishing in this reach. In the spring, flows are generally increased as runoff increases inflows into the reservoir. Higher spring flows are passed as needed for flood control, with a target reservoir refill date of April 1. All flows are passed as spill until the powerplant resumes power generation in the spring, typically in March.

Under Alternative A, the proposed maintenance and rehabilitation construction activities would not occur. Current operations and maintenance at American Falls Dam would continue as they have in the past. This includes standard operations of the dam to generally pass an unofficial minimum release of 300 cfs in the non-irrigation season with a target reservoir refill date of April 1. It also includes releases through the irrigation season managed to meet downstream demands to Milner Dam. Flows are adjusted through the irrigation season to maintain Lake Walcott at a constant elevation of 4,245 feet.

2.4 Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Reclamation proposes to perform construction activities necessary for the maintenance and rehabilitation of the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin floor structures at American Falls Dam. This project would consist of the cutting, removal, and replacement of existing damaged concrete. In addition, it would include reinforcement and replacement or modification of an existing drain grate. This project would address the need for the replacement and repair of concrete on these dam structure components. The components have cracked, spalled, and otherwise deteriorated over their 40 years of service. They require repair before further deterioration compromises the integrity of the dam.

Reclamation proposes to contract for the construction activities necessary to: (1) cut, remove, and replace existing damaged concrete and reinforcing on the spillway, spillway gate operator decks, downstream dam face concrete, and stilling basin structures; and (2) replace or modify an existing drain grate to facilitate future access for maintenance. These maintenance and rehabilitation activities would include hydroblasting and saw cutting, removal, and offsite disposal of existing deteriorated concrete; repair or replacement of deteriorated concrete;

removal and replacement of damaged reinforcing, where it is encountered; replacement or modification of an existing drain grate to provide a removable section to facilitate access for maintenance; traffic control for the periods of highway closure necessary to facilitate this work; and implementation of monitoring and mitigation measures to ensure that all downstream water quality standards put forth by the IDEQ are not violated throughout the operation.

The major construction components of the proposed action are:

- **Stilling basin floor concrete removal/repair**: A 4-inch thick epoxy bonded overlay plus an additional 2 inches of original concrete below the overlay would be removed. The removed concrete would be replaced with a 6-inch overlay and single mat of reinforcing doweled into the existing concrete.
- **Spillway face concrete removal/repair**: Approximately 6 inches of concrete on the spillway face would be removed to expose sound concrete. The removed concrete would be replaced with a 6-inch lift of replacement concrete.
- **Gallery adit replacement**: The adits located on the east and west sides of the spillway would be removed and replaced. It is anticipated this would require complete removal and replacement of the adit concrete from the downstream face of the dam outward.
- **Spillway gate operator deck (pier deck) repair**: Repair of deteriorated concrete on the edges of all spillway gate operator decks would be performed.
- **Downstream dam face concrete repair**: Localized repair of cracked and damaged concrete on both the left and right downstream faces of the dam would be performed.
- **Drain grate replacement**: The existing drain grate would be removed and replaced or modified to provide a removable section to facilitate future access for maintenance.

Specific construction methods used to accomplish each of these tasks would be proposed by the contract awardee and subject to approval by Reclamation. Compliance with applicable industry best practices would be required of the contract awardee.

This work would occur in two separate years, within a proposed seasonal construction window of May 1 to November 23 in both 2020 and 2021. The portions of the proposed construction work taking place within the waterway would require a lockout and complete dewatering of the spillway and stilling basin, during which time all flows would instead have to pass through the powerplant. This in-waterway work would begin on or after August 1 and cease by November 23 in both 2020 and 2021. For the two years this project would occur, an agreement between Reclamation and Idaho Power would provide for the continued passage of flows through the powerplant throughout this late season timeframe, which would enable uninterrupted water deliveries. Reclamation would in turn agree to provide 1,000 cfs of water (an increase from typical winter flows) from October 16 to November 23, which would enable Idaho Power to continue minimal generation rather than passing water at “speed no load” for an extended timeframe. Work would occur in the waterway for an estimated maximum of 152 days within

the 2 year duration of this project, and all water would pass through the Idaho Power powerplant during this timeframe.

During the in-waterway construction periods in both years, westbound State Highway (SH)-39 (Aberdeen Highway) where it crosses the dam would be closed, and all traffic rerouted to eastbound SH-39 under coordination with the Idaho Transportation Department (ITD), with periodic scheduled closures for the passage of oversized vehicles to accommodate the seasonal agricultural needs of the region. These traffic control restrictions would be in place for an estimated 113–130 days within the 2 year duration of this project.

2.5 Alternatives Considered but Eliminated from Further Study

In the early stages of proposal development, Reclamation explored the feasibility of modifying an existing pipeline to permanently create a third means to pass water through the dam during the construction period. However, due to engineering constraints and a high estimated expense required for successful implementation of this alternative, this alternative was deemed unfeasible and eliminated from further consideration.

Variations on the seasonal timing of in-waterway construction windows were also preliminarily considered, but were eliminated through coordination discussions with other management and regulatory agencies (e.g., IDEQ, IDFG), and in order to meet the need to reach a timely agreement with Idaho Power for flow passage.

2.6 Actions Considered for Cumulative Effects

Cumulative Effects are defined in 40 CFR 1508.7 as the effect on the environment that results from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions. The Council on Environmental Quality interprets this regulation as referring only to the cumulative effect of the direct and indirect effects of the proposed action and its alternatives when added to the aggregate effects of past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

Past, present, and reasonably foreseeable actions identified in the area (public or private) that could adversely affect the same resource areas evaluated in this EA, would be additive effects to the proposed project. These actions are considered for cumulative effects and are identified below.

2.6.1 Boat Ramp Rehabilitation (2017-2018)

Rehabilitation of the West Boat Ramp, near the most popular beach on the American Falls Reservoir, was completed in 2018. Prior to rehabilitation, this beach section closest to the dam was considered the best for shoreline fishing, and was easily accessed by vehicles and

pedestrians via the boat ramp as water receded. Rehabilitation of the ramp included raising the height of the ramp, and placement of large rip rap for stabilization. This currently prevents all vehicle entry and severely restricts pedestrian access to the beach. Fishing from the ramp and docks is prohibited for safety. Pedestrian access to the beach is still possible, but is made difficult by the rip rap. There has been considerable public complaint about the loss of beach access that has occurred over the past 2 years. Reduced access at the ramp has displaced more shoreline fishermen and beach users to the West Wall recreation site at the dam, where fishing is better, but it is difficult for pedestrians to get to the beach. Public access areas mentioned here are further discussed and identified in Figure 8 in Section 3.7 of this document.

2.6.2 Idaho Power Powerplant Overhaul (2023-2024)

Idaho Power is planning to perform a total control upgrade and refurbishment of all three generating units at the powerplant at American Falls Dam, beginning approximately January 2023. The control work will involve a full plant outage for the first 6-8 months, after which Idaho Power plans to operate two generating units intermittently for the next 12 months while refurbishments are completed (Dobey 2018, pers. comm.).

2.6.3 Federal Energy Regulatory Commission (FERC) Relicensing (2025)

Idaho Power holds an active FERC license which authorizes the generation of hydroelectricity at the American Falls powerplant through February of 2025 (FERC 2018). At least 5 years before a license expires, the licensee must file a notice of intent declaring whether or not it intends to seek a new license (relicense) for its project. At least 2 years before a license expires, the licensee must file an application for new license. The overhaul planned for the preceding years is intended to prepare the powerplant for relicensing. It is the intent of Idaho Power to apply for and complete the relicensing process.

2.6.4 Long-Term Planned Operations and Maintenance (O&M) (Ongoing)

Reclamation plans and performs ongoing maintenance (e.g., inspections, cleaning, repair, repainting, etc.) on an ongoing basis, which has the potential to necessitate alterations to the configuration, timing, or amount of flows passing through American Falls Dam. Reclamation makes every effort to plan, schedule, and perform non-emergency O&M activities with minimal disruption to normal water deliveries throughout the year. This ongoing O&M falls under the general range of operations for American Falls Dam.

Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

The Affected Environment Chapter evaluates the environmental consequences of implementing each of the alternatives described in Chapter 2. The level and depth of the environmental analysis corresponds to the context and intensity of the impacts anticipated for each environmental component (resource). The affected environment (proposed action area) addressed in this EA is defined in varied contexts, depending on the affected resource being analyzed.

In its broadest hydrologic sense, the affected environment includes the Snake River from below Palisades Dam to American Falls Reservoir up to the high-water mark; the Snake River upstream to Palisades Dam; and the Snake River downstream to Milner Dam, including the stilling basin immediately below American Falls Dam, and Lake Walcott up to the high-water mark, including parts of the Minidoka National Wildlife Refuge. However, each resource with the potential to be affected is analyzed on an applicable individual scale. For example, the noise effects of construction are analyzed only for the areas at and near the construction site that would be affected. Effects to transportation are analyzed in terms of users likely to experience effects from increased traffic and traffic controls during this project, including residents of American Falls and the surrounding area, as well as businesses and visitors that utilize Idaho SH-39.

Resources analyzed in Chapter 3 were selected based on Reclamation requirements; compliance with laws, statutes and executive orders; public and internal scoping; and their potential to be affected by the proposed action.

3.2 Hydrology

3.2.1 Affected Environment

Watershed Geography and Water Storage Facilities

The Snake River has a total drainage area of approximately 13,600 square miles at American Falls Dam. Major tributaries to the Snake River include the Henrys Fork and Willow Creek. American Falls Reservoir serves as a major water storage and power generating facility in southeastern Idaho. American Falls Dam provides water supply for approximately 1,150,000 acres of irrigated lands, limited flood control during spring time runoff, and power production during the summer and fall months. Water is stored in American Falls Reservoir within the operational framework of the other upper Snake River storage facilities upstream

of Milner Dam in southern Idaho. Figure 5 shows the nine dams upstream of Milner Dam that store and regulate water in the upper Snake River watershed.

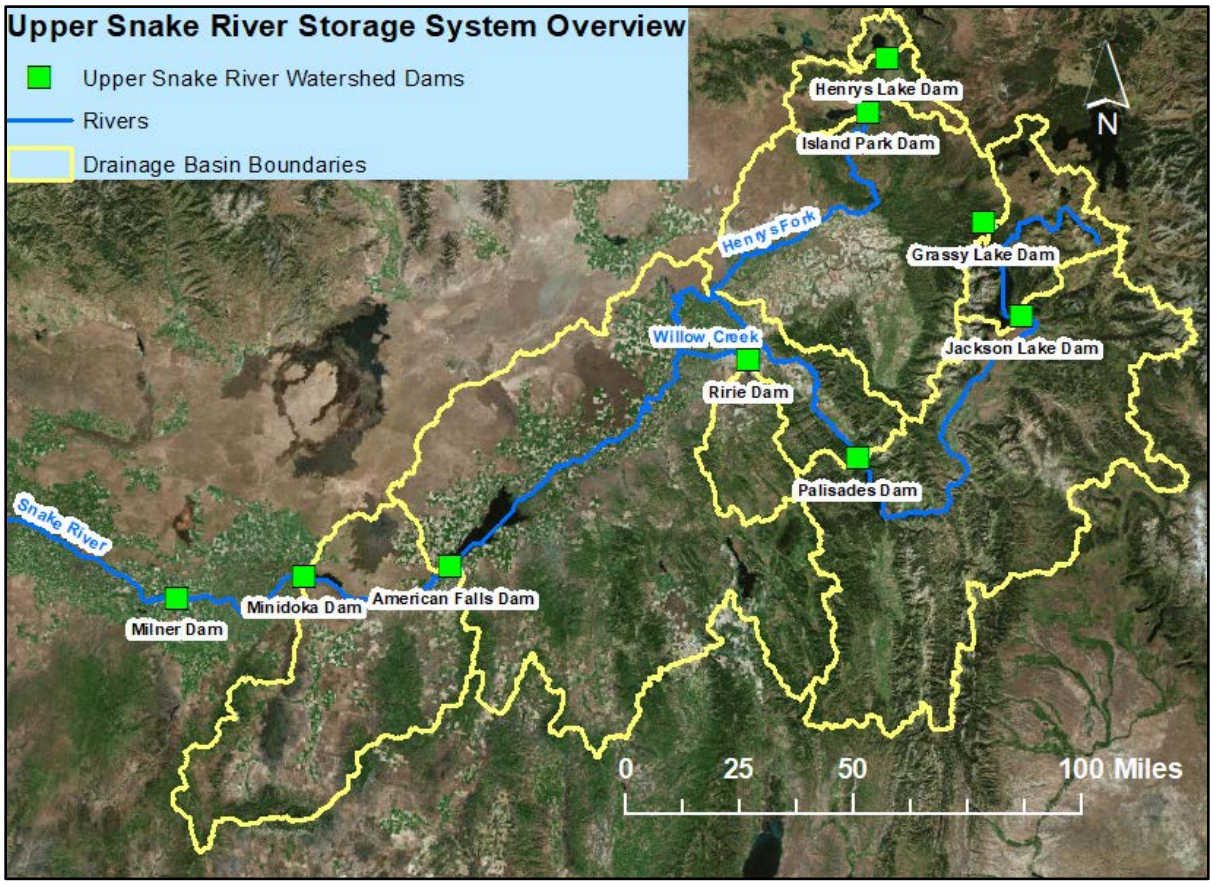

Figure 5. Overview of facilities in the upper Snake River watershed. Drainage basins are delineated in yellow.

Henrys Lake Dam and Milner Dam are privately owned. The other seven dams, all owned and operated by Reclamation, include: Jackson Lake Dam, Palisades Dam, Ririe Dam, Island Park Dam, Grassy Lake Dam, American Falls Dam, and Minidoka Dam. American Falls Reservoir contains the greatest amount of storage space of the nine reservoirs. The reservoir and dam serve as the primary water supply delivery point for downstream irrigation in the greater Magic Valley area, which includes the areas surrounding Burley, Rupert, Twin Falls, Jerome, and Gooding, Idaho.

The nine dams in the upper Snake River watershed are operated together as a system for overall water management, with the target of maximizing water supply storage for irrigation, power, and wildlife management demands. Water passing through the reservoir system that is not diverted for irrigation or other uses travels past Milner Dam to the lower Snake River, into the Columbia River, which flows to the Pacific Ocean.

Flood Control

Flood control operations enable reservoir space to be used to manage and buffer peak flows that would otherwise be too high for safe channel capacity, generally during the April through July springtime runoff period. Snowpack accumulation is monitored through the winter and spring months every year to determine the likelihood of whether creating or maintaining any unfilled reservoir space will be necessary. If flood control space is required, then an appropriate amount of water storage space is vacated by releasing water from the respective reservoirs. If no need for flood control space is anticipated, then little to no storage space is reserved for the high spring inflows. Flood control operations are managed by Reclamation, in coordination with the U.S. Army Corps of Engineers.

System Management in a Typical Water Year

During the winter months when demand on the water supply is low, minimum flows are typically released from the dams, and the amount of water stored in the reservoir system increases. During the spring months when snowmelt occurs in the headwaters of the Snake River and Henrys Fork, flows into the reservoir system increase to levels which are greater than early irrigation system demand. Since much of this water is retained, overall water storage in the reservoir system continues to increase until the spring runoff decreases and is surpassed in amount by rising summer irrigation demand, at which time the total stored water in the reservoir system reaches its yearly maximum. From that time on, the system water storage content decreases as water is released to meet downstream water demands. In the late summer or early fall when irrigation demand seasonally reduces to levels lower than the base flows into the reservoir system, the system storage content begins to increase again.

American Falls Reservoir

During typical water years American Falls Reservoir reaches a yearly maximum storage level during the April through May timeframe, and then storage decreases as discharges for downstream water use surpass inflows from upstream water supply sources. During the summer months, the amount of water released from the reservoirs upstream of American Falls Reservoir is targeted to meet, but not to exceed, water supply demand downstream of each reservoir. Releases from Palisades Dam are managed to maintain approximately 2,000 cfs in the Blackfoot, Idaho reach of the Snake River (just upstream of American Falls Reservoir). It is common each year for American Falls Reservoir to be over 90 percent full in the April through May timeframe, with a storage content decrease to approximately 15 percent full by the end of September.

In years when precipitation in the headwaters of the Snake River is well below average (dry water years), American Falls Reservoir may only refill to a peak of 70 percent of full water storage capacity by the late March timeframe, after which reservoir levels may decrease to below 10 percent capacity by the September timeframe. In years when precipitation in the

headwaters of the Snake River is well above average (wet water years), American Falls Reservoir may refill completely and remain full through the July timeframe.

Figure 6 shows a representation of the daily storage levels for American Falls Reservoir over a 30 year period from 1981 to 2010, demonstrating the seasonal storage level patterns described above. The darker gray band illustrates the range into which daily reservoir storage levels fell in 50 percent of years, called the 75 percent to 25 percent exceedance range. The light gray bands above and below the 75 percent to 25 percent exceedance range illustrate the range into which daily reservoir storage levels fell in the next 15 percent of the years on either side of the 75 percent to 25 percent exceedance range (meaning that reservoir storage levels fell within the range illustrated by both gray bands combined in 80 percent of all years). The white bands between the maximum and minimum lines and the edge of the light gray bands represent the top 10 percent and bottom 10 percent of years in terms of range of reservoir storage.

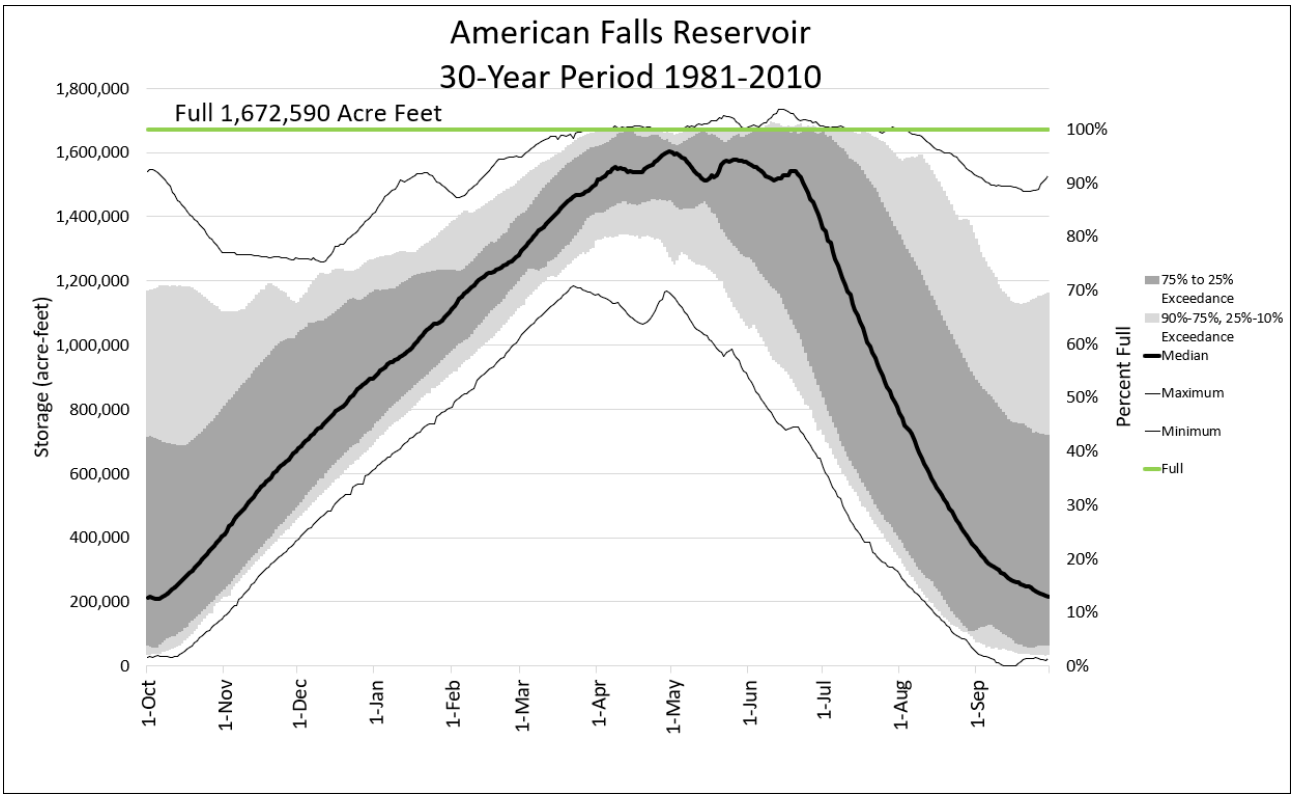

Figure 6. Daily historic storage data for American Falls Reservoir for a 30 year period from 1981 to 2010. Storage data can be retrieved from Reclamation's historical database: https://www.usbr.gov/pn/hydromet/arcread.html (last accessed May 2, 2019).

Snake River Below American Falls Dam

Snake River flows (measured at the United States Geological Survey gage at Neeley, Idaho, approximately 1 mile downstream from American Falls Dam) vary widely depending on the time of year, irrigation demand, and water supply (Figure 7).

Figure 7 shows a representation of the daily discharge from American Falls Dam for the 30 year period from 1981 to 2010 that demonstrates the seasonal flows during winter, spring and summer. The maximum, minimum, median, 90 percent to 75 percent exceedance range, 75 percent to 25 percent exceedance range, and 25 percent to 10 percent exceedance range are shown and defined as in Figure 6.

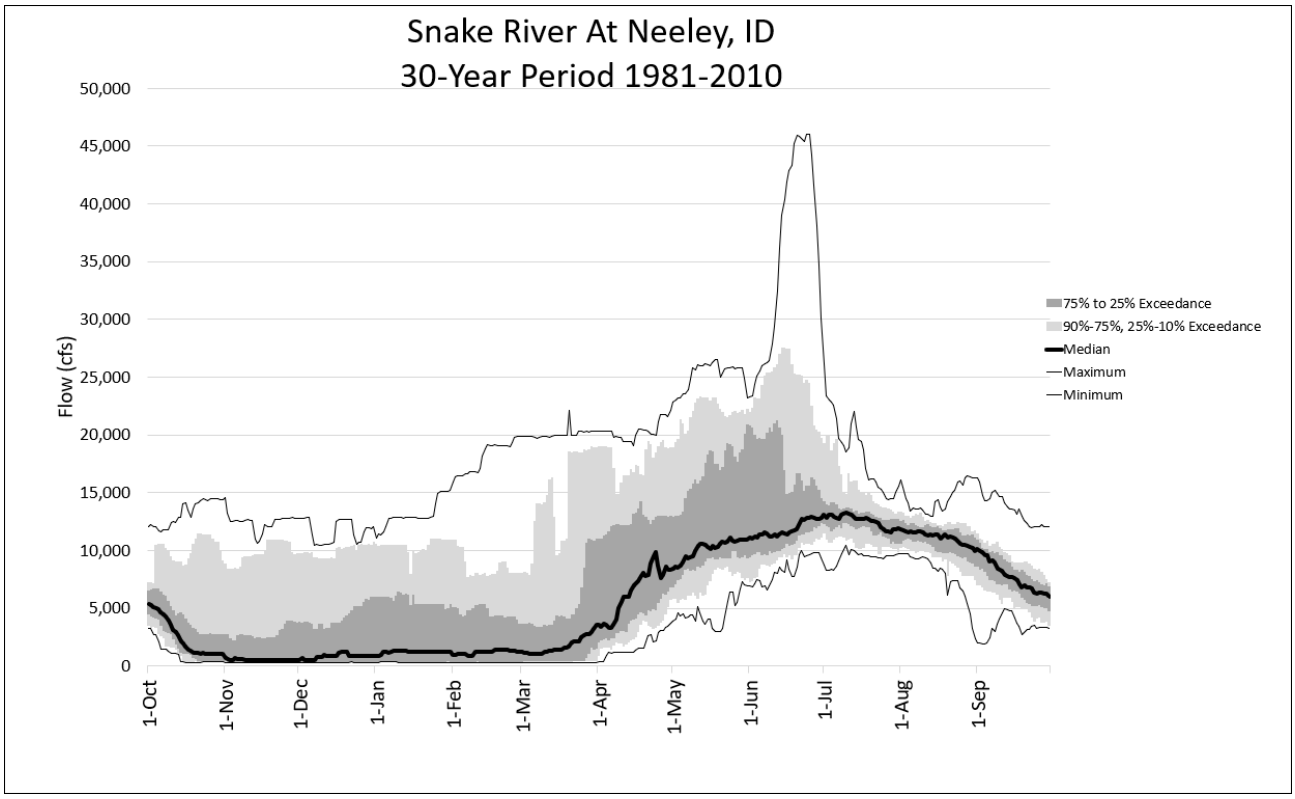

Figure 7. Daily historic flow data for the Snake River at Neeley, ID (below American Falls Dam) for the 30 year period 1981 to 2010. Flow data can be retrieved from Reclamation's historical database: https://www.usbr.gov/pn/hydromet/arcread.html (last accessed May 2, 2019).

Discharges from American Falls Dam above 15,000 cfs (requiring the availability of the spillway and stilling basin to pass flows for downstream water use) rarely occur during the proposed work window. Since 1981, American Falls dam has discharged flows higher than 15,000 cfs in only 2 years during the proposed work window dates (August 1 to November 23). Both water years experienced high spring and summer runoff that caused American Falls Dam to essentially pass inflow during August. In both water years, the flow that was greater than 15,000 cfs during August could have been stored in upstream reservoirs.

Summer releases from American Falls are dictated by downstream irrigation demands and downstream water rental pool leases below Milner Dam. Discharges from American Falls Dam also supply a varying amount of flow augmentation storage water that Reclamation is required to deliver out of the upper Snake River watershed for the benefit of migrating fish in the Columbia River. Typically, flow augmentation is released as early as possible each year after any flood control operations are complete. Volumes released are dependent on the

system storage remaining at the end of the previous year (carryover), and spring runoff forecasts. In-depth information related to flow augmentation from the Upper Snake watershed may be found in the May 5, 2008 National Oceanic Atmospheric Administration (NOAA) National Marine Fisheries Service's (NMFS) biological opinion (NMFS 2008).

In general, a minimum flow of 300 cfs is maintained during the winter months. The magnitude of winter flows depends principally on the amount of stored water remaining in American Falls Reservoir and the reservoir system upstream at the end of the preceding irrigation season, known as "carryover storage." If carryover storage is high, estimates are made of the amount of un-storable flow expected prior to the following irrigation season. If the carryover storage is substantial, winter releases may range from 5,000 cfs to 10,000 cfs. However, typically winter releases between late October and late February are between 300 and 1000 cfs.

Lake Walcott

During typical water years, Lake Walcott is maintained close to full to optimize power generation at the Minidoka Dam powerplant. During the summer months, the amount of water released from American Falls Reservoir (which enters Lake Walcott) and from Lake Walcott are set to maintain a fairly constant pool level. There are two canals that divert directly from Lake Walcott. Their headworks are included in the Minidoka Dam superstructure. During the winter months, the reservoir is maintained slightly below full and maintained at a constant level.

3.2.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

Under the No Action Alternative, water management operations would continue as they have in the past. Without maintenance and repair work, the downstream concrete face of American Falls Dam would continue to deteriorate in the short- and long-term, which would allow the material being dislodged from the stilling basin to be transported and deposited in the downstream river reach. However, this minor deposition of material would not be expected to measurably affect channel hydraulics. Therefore, basin hydrology at American Falls Dam, the Snake River between American Falls Dam and Lake Walcott, Lake Walcott, and the Snake River below Minidoka Dam would be unaffected under the No Action Alternative.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

American Falls Reservoir and Lake Walcott

Under the proposed action, due to construction activities, the spillway and stilling basin would be unavailable for water passage August 1st to November 23rd for 2 years. All flows would have to be passed through the powerplant for approximately 6 additional weeks after the powerplant would typically shut down. From 1981 to 2010, the daily average discharge from American Falls Dam during the late October to late November timeframe was approximately 540 cfs. However, to mitigate the potential for damage to equipment that passing water at speed no load for an extended period could create, Reclamation would agree to provide a minimum of 1,000 cfs of flow throughout the in-waterway construction period to enable minimal power generation by the turbine unit that would be passing the flow. This would constitute a flow increase of approximately 460 cfs, sustained for approximately 6 weeks from October 15th until November 23rd in each of the 2 construction years. Over this 6 week period, the additional water released and moved from American Falls Reservoir into Lake Walcott each year would total approximately 38,000 acre-feet, which corresponds to an approximate 1-foot water level change in American Falls Reservoir.

To preserve the overall management approach of the upper Snake River watershed and not "lose" this additional water, the extra flow that would be released during the 6 week period starting October 15th would be captured in the next downstream reservoir, Lake Walcott, which is regulated by Minidoka Dam. To enable this, beginning in September and ending by October 15th a temporary storage deficit of approximately 38,000 acre-feet would be created in Lake Walcott by reducing releases from American Falls Dam to levels below the irrigation demand downstream of American Falls Dam. This would allow Lake Walcott to draft approximately 38,000 acre-feet lower than it normally would during the September and October time frame. The 38,000 acre-feet temporary storage deficit in Lake Walcott corresponds to a decrease in pool level that is approximately 4 feet lower than the normal pool level of 4,245 feet. This decrease in pool level would begin in early September, and reach a maximum drawdown point in mid-October. The target drawdown pool elevation would be 4,241 feet by October 15th in 2020 and 2021. If local inflows into Lake Walcott are exceptionally high in the years during construction, a drawdown level of 4,240 feet may be needed to enable recapture of the increased releases from American Falls Reservoir during the time from October 15th to late November.

Under this management scenario, by the mid-October timeframe, storage content in Lake Walcott would be reduced to between 40,000 and 57,200 acre-feet (between a 4- and 5-foot water level drawdown). Recapture of the additional discharge from American Falls during the October to November construction period would then refill Lake Walcott, which would be approximately full by the end of the work window. After that time, discharge from

American Falls Dam would be reduced to typical winter flows of 540 cfs or less. These short-term effects to reservoir management are not significant as they do not impact river hydraulics, and fall within the historic range of typical water storage levels in the reservoirs.

This slight alteration of location and timing of water storage and releases would not significantly affect the overall system reservoir management, and would still fall within the historic range of operations.

Water Delivery and the Snake River Below American Falls

If a high-water year scenario were to occur in 2020 or 2021, upstream storage would be managed so that the outflow from American Falls Reservoir could be limited to 15,000 cfs, and could be passed through the powerplant without necessitating the use of spill.

The proposed action could potentially create an unlikely, but possible, scenario in which flow through Idaho Power's powerplant could be insufficient to meet downstream water demands during the in-waterway work window (August 1 through November 23).

In early August, downstream irrigation demand could be as high as 11,500 cfs. If water quality monitoring below the dam shows DO concentrations falling below the instantaneous minimum of 3.5 milligrams/liter (mg/L), Idaho Power would cease power production and pass water at speed no load until DO concentrations were brought back into compliance with state standards through implementation of the mitigation measures outlined in Section 3.3 of this document (Water Quality), and detailed in Appendix D. The maximum discharge through the powerplant while at speed no load configuration is limited to 2,400 cfs. Therefore, if the powerplant stopped power generation due to low DO concerns, the limited flow would not be sufficient to fulfill downstream irrigation demands. In the case of this scenario, any deficit in downstream water delivery needs would be provided by drafting Lake Walcott storage as additional step-wise mitigation measures were implemented. If mitigation measures did not successfully raise DO to the minimum threshold quickly, the water supply in Lake Walcott could be significantly reduced over several days to levels that could make continued delivery of downstream water needs difficult. Under this scenario, the available water stored in Lake Walcott could be nearly depleted in approximately 5 days.

Were this scenario to occur, it would become evident that Reclamation would need to evaluate evacuation and use of the stilling basin in order to pass sufficient water to continue sufficient downstream water delivery. Demobilizing and clearing heavy machinery out of the stilling basin would require a minimum of 2 days after any decision is made before delivery of flows sufficient to meet the demands of downstream water users could be resumed.

However, these potential effects of river and reservoir management would not be considered significant, as the historic data record (Appendix C) shows this scenario is highly unlikely to occur, would likely be very short in duration if it did, and if needed, spill could be used to restore sufficient water supply to the Snake River in a timely manner to minimize hydrologic effects, as outlined in the project Draft Water Quality Restoration Plan (Appendix D).

3.2.3 Cumulative Effects

The work under the proposed action alternative is scheduled to be completed in late 2021. The Idaho Power powerplant is scheduled to undergo an overhaul from 2023 to 2024, which will include outages for all three units at the powerplant in an alternating schedule. If the proposed action were to be delayed or pushed into 2023 or 2024, there is a potential that releases from American Falls Dam could be limited over a longer continuous period than the in-waterway work window for the proposed project alone. This could cause Lake Walcott to decrease in storage content to a level that would make delivery of flows sufficient to meet the demands of downstream water users difficult.

3.2.4 Mitigation

To ensure adequate downstream water deliveries are maintained throughout the proposed project, the overall water operations management strategy outlined in Section 3.2.2, developed in conjunction with a Water Quality Restoration Plan, would be targeted throughout the duration of the proposed project. With these plans, Reclamation would be adequately prepared to manage potential scenarios of temporarily limited water delivery from American Falls Dam without interrupting overall downstream water supply, or violating state water quality standards. The full Draft Water Quality Restoration Plan can be reviewed in Appendix D.

3.3 Water Quality

3.3.1 Affected Environment

American Falls subbasin covers approximately 2,869 square miles (IDEQ 2014). Towns within the subbasin include American Falls, Aberdeen, Blackfoot, Firth, Shelley and the Fort Hall Reservation. Major land uses in the subbasin include dryland and irrigated agriculture and livestock grazing. Located in the American Falls subbasin, American Falls Reservoir is the largest reservoir in the Minidoka Project and supplies irrigation water to over 1,150,000 acres (Reclamation 1995). Major reservoir tributaries include the Snake River, Spring Creek, McTucker Creek, Danielson Creek, Bannock Creek, and Ross Fork (IDEQ 2014). In addition to supplying water for irrigation, American Falls Reservoir is also used for flood control, power generation by Idaho Power, fish and wildlife habitat enhancement, and recreation (Reclamation 1995).

Water Quality Standards

IDEQ has designated the following beneficial uses for American Falls Reservoir: aesthetics, agricultural and domestic water supply, industrial water supply, cold water aquatic life, primary and secondary recreation, and wildlife habitat (IDEQ 2017). American Falls Reservoir currently does not support the cold water aquatic life beneficial use due to

nutrient/eutrophication, DO, sediment/siltation, and chlorophyll-a (IDEQ 2019). Of these deficiencies, only DO and chlorophyll-a have numeric standards—DO is to be at or greater than 6 mg/L and chlorophyll-a is to be 0.015mg/L or less. However, as identified in the American Falls Subbasin Total Maximum Daily Load (TMDL) Plan: Subbasin Assessment and Loading Analysis, "…it is recommended that for future 303(d) lists, American Falls Reservoir be delisted for sediment, nutrients and DO as load reductions from tributaries and meeting chlorophyll-a targets is expected to achieve water quality standards and beneficial uses (IDEQ 2012a)."

The Snake River downstream of American Falls Reservoir is in the Lake Walcott subbasin. Beneficial uses for this 13.36-mile river segment are the same as those designated for American Falls Reservoir, and IDEQ has identified this river segment as supporting these beneficial uses (IDEQ 2017). This Snake River segment is not water quality limited. However, the Lake Walcott TMDL does include an informational sediment TMDL in the river segment from American Falls Dam to Massacre Rocks and from Massacre Rocks to Lake Walcott due to effects of erosional sediments along the river corridor during high-flow events (IDEQ 2012b).

Contaminants – American Falls Reservoir

In the American Falls Subbasin Assessment and TMDL (IDEQ 2012a), the main water quality issues identified at American Falls Reservoir are periodic high water temperatures and low DO concentrations that restrict trout habitat to a small portion of the reservoir. IDEQ determined the likely limiting nutrient to be total phosphorus (TP), which has been addressed in the tributaries through the TMDL process. To address low DO concentrations, IDEQ has recommended a target concentration of 0.015 mg/L of chlorophyll for American Falls Reservoir (IDEQ 2019).

The 2012 American Falls Subbasin TMDL Plan: Subbasin Assessment and Loading Analysis identified that American Falls Reservoir DO concentrations are generally higher than 7 mg/L, except in the summer when the DO concentrations can decrease to as low as 5.5 mg/L. Low DO concentrations may be attributed to the algae population collapse that tends to occur in the late summer. The report speculates that cloud cover or late summer rainstorms reduce the available sunlight and phytoplankton respire more, consuming oxygen rather than producing it via photosynthesis, which decreases DO concentrations in the reservoir. The report also identified that water temperature for usable trout habitat is typically less than 19°C. Water temperatures in American Falls Reservoir typically have ranged from 5 to 12.5 °C, but temperatures measured at the surface have been as high as 22°C in the summer (IDEQ 2012a).

Sediment and siltation can become an issue at American Falls Reservoir during low water years in which the reservoir is drawn down to low levels to meet water delivery demands. Natural channels are created that cut through the reservoir bottom sediment, causing the water to become sediment-laden and murky before passing through the dam. This is

discussed in greater detail in the following *Contaminants – Snake River below American Falls Reservoir* subsection.

Other contaminants surveyed in American Falls Reservoir were found at relatively low levels in water and sediment (IDEQ 2012a). Biological samples had mercury, selenium, DDE (dichlorodiphenyldichloroethylene, a break down product of the insecticide dichlorodiphenyltrichloroethane, commonly known as DDT), and PCB (polychlorobiphenyl) levels which were at or near recommended maximums (IDEQ 2012a). IDEQ has not fully identified or evaluated the contaminant sources, effects of fluctuating reservoir level, and long-term trends.

Contaminants – Snake River below American Falls Reservoir

Although the Snake River segment below American Falls Reservoir has been identified as supporting all its beneficial uses, there are still some water quality issues that arise. Sediment/siltation and low DO concentrations in water received from American Falls Reservoir are common water quality issues.

Idaho Power monitors DO concentration and water temperature per its FERC hydropower license. Minimum DO concentration standards to be met below American Falls Dam from May 15th through October 15th are (IDA 2019):

- 30-day mean of 5.5 mg/L;
- 7-day mean minimum of 4.7 mg/L, and
- Instantaneous minimum of 3.5 mg/L

Idaho Power uses up to two aerators just downstream from the dam to infuse oxygen into the river water to meet or exceed the minimum DO concentration standards. If DO concentration minimums cannot be met, Idaho Power passes water through American Falls Dam as spill, increasing DO concentrations through turbulent, aerated water. The Lake Walcott Subbasin Assessment and Total Maximum Daily Loads Five Year Review stated that DO levels are generally being maintained at or above required concentrations (IDEQ 2012b).

During drought and low water years, American Falls Reservoir can be drawn down to low levels to meet water delivery demands. This draw down can create natural channels through the reservoir bottom sediment, causing the water to become sediment-laden and murky before passing through the dam. The entrained sediment is discharged into the Snake River and can cause instream total suspended solids (TSS) and turbidity to increase, which may impact recreational fishing and boating and the cold water aquatic life beneficial use.

IDEQ documented these occurrences in the 2012 Lake Walcott Subbasin Assessment and Total Maximum Daily Loads Five Year Review document. IDEQ stated:

> "This situation occurred during a 45-day period from August 31–October 14, 2007, during which the BOR's [Reclamation's] management actions caused the water in American Falls Reservoir and the Snake River downstream to have elevated sediment and turbidity levels such that water quality violations and a fish kill occurred. In 1994 and 2001, similar water quality violations occurred due to similar BOR [Reclamation] management actions. However, this most recent event occurred for a much longer duration than in past years" (IDEQ 2012b).

In 2010, IDEQ and Reclamation finalized and implemented a Water Quality Management Action Plan (Appendix B) in the American Falls Reservoir and Snake River below the American Falls Dam during periods of drought or low flow. The action plan was designed to outline water quality monitoring projects, best management practice (BMP) implementations, and operational considerations that Reclamation would undertake to address water quality issues, including excess sediment and increased turbidity, in the Snake River below American Falls Dam.

Water Quality Data

Water quality data for both American Falls Reservoir and Snake River below American Falls Dam available to the public and can be found at https://www.waterqualitydata.us/portal/ (last accessed May 2, 2019). This database is a cooperative service sponsored by the United States Geological Survey, the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council.

3.3.2 Environmental Consequences

Water quality data and graphs used in the Environmental Consequences section are found in Appendix C.

Methods and Criteria

Idaho State Water Quality Standards identified in IDA 2019 are used as a baseline to identify if, and to what magnitude, Reclamation actions could potentially affect water quality. The State of Idaho's 2014 Integrated Report is used to compare and contrast Reclamation effects in combination with known water quality issues. The specific area of potential effect is American Falls Reservoir and the Snake River immediately below American Falls Dam.

Alternative A – No Action

American Falls Reservoir

Reservoir water quality would continue to change based on anthropogenic and natural upstream watershed inputs, snow pack/precipitation events, reservoir drawdowns/drought, and cyclic changes in reservoir biology. Nutrients, mostly dissolved phosphate concentrations, would decrease slowly in the reservoir water column because of TMDLs administered to the contributing tributaries that limit the concentrations of nutrients identified

in the Water Quality Affected Environment section. Additionally, the reservoir sediments likely serve as a phosphate sink, where phosphates are buried under depositing sediments and continually removed from the water column as long as the sediments are not disturbed. If sediments are disturbed, the buried phosphate could become bioavailable and reintroduced into the water column.

Biological and weather processes that contribute to algae population collapse in late summer would likely continue to some extent and directly and indirectly affect reservoir DO, as described in IDEQ 2012a. When these conditions occur (typically in the late summer), DO concentration could decrease to as low as 5.5 mg/L until wind and wave action reintroduces oxygen into the water column, raising DO concentrations.

Sediment, siltation, and increased turbidity would continue to directly and indirectly affect the reservoir as described in the Water Quality Affected Environment section. This is most apparent during low water years in which the reservoir is drawn down to low levels to meet water delivery demands and during drought. To minimize these water quality effects to the reservoir and the Snake River immediately below the reservoir, Reclamation created an Action Plan in 2010 (Appendix B). This Action Plan is used to:

> "… minimize the frequency, extent and duration of American Falls Reservoir drawdown below 50,000 acre-feet….[In] drier years when system storage above the project is nearing depletion, Lake Walcott drafting may begin as early as mid-August, in order to retain a minimum volume target of 100,000 acre-feet in American Falls Reservoir in an attempt to meet water quality compliance standards and ESA requirements below American Falls Dam."

When the water level in American Falls Reservoir drops below 100,000 acre-feet, Reclamation has committed to collecting water quality samples above and below American Falls Reservoir on a weekly basis. The samples are collected above the reservoir at Tilden Bridge and immediately below the dam. The samples are analyzed at Reclamation's water quality laboratory for total suspended solids, suspended sediment concentration, volatile solids, and turbidity (Appendix B). The extensive water quality monitoring is used to aid in reservoir management and to help predict if or when sediment issues may occur. Reclamation recognizes that in some years, if hydrologic conditions (typically drought) and irrigation demand on reservoir storage preclude retaining the target volume of 100,000 acre-feet, discharges below American Falls may not be in compliance with TSS targets (Appendix B).

Excess sediment can also enter the reservoir via the shoreline. To reduce sedimentation from the shoreline, Reclamation initiated a shoreline protection program in the 1980s to address ongoing bank erosion and the subsequent potential loss of farmland. Reclamation purchased land around the reservoir to ensure that no further loss of private property would occur. Stabilization efforts included placing over 110,000 linear feet of bank rip rap on the shoreline to approximately 8 feet below full pool. These measures are effective for preventing erosion of the shoreline during higher pool elevations by minimizing re-suspension of sediments

from seiches and waves. Shoreline erosion and sedimentation would continue to directly and indirectly affect reservoir water quality during higher pool elevations on the vast majority of the reservoir's shoreline that is not protected with rip rap. The shoreline protection program would continue to add rip rap as funding and time is available, reducing the potential for shoreline sediments to enter the reservoir.

Snake River below American Falls Dam

The Snake river immediately below American Falls Dam is directly affected by the water released from the reservoir. This river segment is expected to continue to support its beneficial uses, as identified in IDEQ 2017. Low DO concentrations and sediment, siltation, and increased turbidity from reservoir discharge water would continue to have the potential for periodic effects on this river segment.

Idaho Power continually monitors DO concentrations from May 15 to October 15, and if DO concentration readings fall below established minimums, Idaho Power uses up to two aerators just downstream from the dam to infuse oxygen into the river water. If that fails to improve DO concentrations, Idaho Power then passes water through the dam as spill, increasing DO concentrations through turbulent, aerated water. These actions would continue to occur and maintain acceptable DO levels below the dam. There have been isolated instances where DO concentrations could not be increased to the minimum level for compliance with IDEQ standards. This most recently occurred in late summer of 2018, and was likely caused by the combination of conditions including algae population collapse, a series of overcast days, and high winds pushing low oxygenated water toward the dam intake (Grossarth 2018).

Sediment, siltation and turbidity from reservoir water would directly and indirectly affect water quality below the dam. As described above in the *American Falls Reservoir* section and in the Water Quality Management Action Plan (Appendix B), Reclamation would continue to target water management throughout the water delivery season to maintain a minimum content of 100,000 acre-feet in American Falls Reservoir at the end of the storage delivery season. These efforts would avoid increased sediment discharged below the dam. This and the shoreline protection would continue to decrease, to some extent, sediment discharged below the dam. However, in some years, if hydrologic conditions (typically drought) and irrigation demand on reservoir storage preclude retaining the target volume of 100,000 acre-feet, discharges below American Falls may not be in compliance with TSS targets (Appendix B) and water quality in the Snake River below the dam would be affected. Effects from the excess sediment would be similar to those identified in IDEQ 2012b.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Construction Effects

Construction activity in the spillway (August 1 to November 23 of 2020 and 2021) could result in contaminant mobilization and transport. Direct and indirect effects to water quality would be minimal and likely be similar to those expected under Alternative A, due to mitigation and BMPs implemented by the contractor. However, complete elimination of sediment and turbidity increases due to construction activities is not possible. These effects from increased sediment (both in the reservoir and below the dam) would be of short-term duration (limited to the in-waterway construction timeframe) and would not contribute to any long-term effects.

The most likely potential contaminant sources from the proposed project include debris or debris-contaminated water from the hydroblasting and removal of the deteriorated concreate, and construction debris from concrete removal. The construction debris would be removed to an appropriate off-site disposal area to reduce potential water contamination, limiting any potential effects to water quality.

The reservoir would indirectly be exposed to construction debris through wind deposition. This effect would be minor and minimized through the construction BMPs, such as dust abatement in the construction site. The Snake River below the dam is most at risk for construction debris contamination. When water initially re-enters the formerly dewatered spillway and stilling basin area, any remaining contaminants from the construction debris would be flushed downstream and could create a sediment plume before being dispersed downstream.

To mitigate for this possibility, the contractor would be required to clean the dewatered area in a manner similar to the cleanup mitigation performed above the Snail Pool Area after the Minidoka spillway construction in 2015 (Reclamation 2010). Turbidity and sediment would likely marginally increase temporarily at the first use of the spillway and stilling basin, but with contractor cleanup of the dewatered area, it is unlikely that state water quality standards for turbidity and sediment would be exceeded.

The proposed project could require a Section 404 permit issued by the U.S. Army Corps of Engineers, and may necessitate a state CWA Section 401 water quality certification for the construction activity. These permits and certifications would outline requirements to minimize the effects to water quality associated with the construction activities.

The heavy equipment used in construction could present potential contaminant sources (e.g., fuels and lubricants) when working in the dewatered area. To mitigate these possible effects, the contractor would be required to create and follow a spill prevention plan that would detail specific BMPs to prevent and minimize these risks. The contractor would also be required to

implement additional BMPs to minimize stormwater runoff and other erosional hazards that could affect water quality.

American Falls Reservoir

The period of in-waterway construction activity during which the spillway and stilling basin must be dewatered (August 1 to November 23 of 2020 and 2021) would be a critical time for DO mitigation below the dam. As identified in the Affected Environment section above, low DO concentrations periodically occur in the reservoir that directly affect the DO concentrations below the dam. A Draft Water Quality Restoration Plan (Appendix D) is being developed to identify a series of step-wise actions that would mitigate potential low DO issues that could occur when water is passed through the dam to the Snake River.

The first step in mitigating potentially low DO concentrations is to operate American Falls Reservoir at elevations similar to past years in which periods of low DO concentration either did not occur or were successfully raised to acceptable state DO concentrations through use of one or both of Idaho Power's aerators. Examples of successful DO mitigation via use of Idaho Power aerators, without use of spill, are shown in Appendix C. The direct and indirect effects of this action would be minimal, because the DO concentrations in the water below the dam would meet state DO standards.

Other water quality parameters would continue to change based on anthropogenic and natural upstream watershed inputs, snow pack/precipitation events, reservoir drawdowns/drought, and cyclic changes in reservoir biology. Following the prescribed actions identified in the American Falls Action Plan (Appendix B), Reclamation would continue to target water management throughout the water delivery season to maintain a minimum content of 100,000 acre-feet in American Falls Reservoir at the end of the storage delivery season. These efforts would avoid increased sediment discharged below the dam. Direct and indirect effects to other water quality parameters would be the same as those identified in the No Action Alternative.

Snake River below American Falls Dam

Direct and indirect effects of this project could include periods of low DO concentrations in the Snake River below the dam that cannot be mitigated by Idaho Power's two aerators. As identified in the Draft Water Quality Restoration Plan, if low DO concentrations persist after operating American Falls Reservoir at elevations similar to past years in which periods of low DO concentration either did not occur or were successfully raised to acceptable state DO concentrations through use of one or both of Idaho Power's aerators, up to three portable aerators placed immediately below the dam would be used (in conjunction with the two Idaho Power aerators) to raise DO concentrations to acceptable state DO concentrations. Continuous reservoir water quality data collected by IDEQ personnel would be used to predict low DO concentration occurrences and to identify what level of additional mitigation (level of additional aeration) is required.

Use of the additional aerators is not without potentially confounding issues. As ambient air and water temperatures increase, the capacity of water to retain dissolved gases, such as oxygen, is reduced. In hotter weather (above 92° F), the aerators' efficiency is decreased and aerator use alone (without the use of spill) may not increase DO concentrations below the dam to IDEQ standards. According to data for American Falls from 1961 to 1990, air temperatures at American Falls tend to be highest in July and August, when the average high is 86° F. Average high temperatures are significantly cooler in September, October and November (75° F, 62° F, and 44° F, respectively). Therefore, August could potentially present conditions that would make aerator function critical (US Climate Data 2019). Additionally, use of all five aerators could create a risk of elevating the Total Dissolved Gas (TDG) above the state criteria for aquatic life (110 percent saturation). In communication with Reclamation, Idaho Power identified that a TDG of 138 percent was experienced during an experimental test use of additional aerators.

Continuous reservoir water quality data collected by IDEQ personnel would be used to predict or identify any low DO and/or increasing TDG occurrences. The data would be relayed to an identified Water Quality Action Team composed of Reclamation, Idaho Power, IDEQ, and IDFG personnel with relevant expertise. The Water Quality Action Team members could then advise Reclamation management as to potential mitigative measures.

The final option to mitigate low DO concentrations below the dam would be emergency spill, which would be held as a last resort. If DO concentration could not be increased to a level that meets the state minimum instantaneous standads (3.5mg/L) using the mitigation efforts previously listed, and under the advisement of the Water Quality Action Team, Reclamation could elect to order the contractor to demobilize so that water could be passed through the regulating gates and stilling basin.

A 48-hour notice would be necessary to accomplish demobilization, including clearing heavy equipment and substantial debris out of the stilling basin. This would likely effectively mitigate any low DO concentrations below the dam, but construction contaminants such as loose concrete and concrete that had not fully cured would be washed into the stilling basin and downstream. Water quality effects from this use of spill would be minor because of the short duration of the action, and because the volume of water released would quickly dilute much of the chemical and physical effects from the construction debris. However, exercise of this mitigative option could significantly delay project completion, and could necessitate an additional year for completion of construction, increasing the duration of overall water quality effects from two seasons to three seasons.

To ensure legal compliance with State of Idaho water quality standard obligations, upon completion of the EA, if a FONSI is issued, Reclamation intends to apply for an IDEQ Short-Term Activity Exemption, identified in the Idaho State Water Quality Standards Section 080.02.b.vi: Maintenance of Existing Structures, (IDA 2019). If granted, this would establish temporary legal compliance with state water quality standards for DO and TDG by

exempting non-compliant low DO concentrations and TDG saturations that would be attributable to the proposed action and its mitigative measures.

3.3.3 Cumulative Effects

When the effects to water quality of the proposed action are considered in the context of the Idaho Power powerplant overall scheduled to take place from 2023 to 2024, they would contribute to a cumulative effect. The Idaho Power powerplant overhaul would include outages for all three units at the powerplant, in an alternating schedule. If the proposed action were to be delayed or prolonged into 2023 or 2024, it is unlikely that the measures identified in the Draft Water Quality Restoration Plan to mitigate low DO (American Falls Reservoir operation and Idaho Power's aerator use to increase low DO concentrations) would be feasible in conjunction with the Idaho Power powerplant overhaul.

3.3.4 Mitigation

Mitigating low DO concentrations below the dam during the construction window would be Reclamation's priority water quality concern. The Draft Water Quality Restoration Plan (Appendix D) identifies the specific actions that would be taken to prevent or alleviate low DO conditions below the dam. The primary method of mitigating potentially low DO concentrations is prevention through operating American Falls Reservoir at elevations similar to past years in which periods of low DO concentration either did not occur or were successfully raised to acceptable state DO concentrations through use of one or both of Idaho Power's aerators.

If DO concentrations cannot be increased by these measures, up to three portable aerators placed immediately below the dam would be used (in conjunction with the two Idaho Power aerators) to raise DO concentrations to acceptable state DO concentrations.

If a low DO concentration issue persists despite implementation of the above mitigation measures, the Water Quality Action Team would advise Reclamation management if discharge through the spillway and stilling basin is warranted. If deemed necessary, Reclamation management could elect to issue a 48-hour vacate notice to the contractor, and then discharge water as spill to increase DO concentrations below the dam.

Beginning 1 week before and continuing throughout the in-waterway construction period, as deemed necessary, IDEQ would monitor reservoir water quality in an effort to predict decreasing reservoir DO concentrations. This monitoring information is critical for decision making and would be reported to key Reclamation personnel to be analyzed and transmitted to the Water Quality Action Team and Reclamation management on a daily basis. See Appendix D for specific details on the Draft Water Quality Restoration Plan.

3.4 Aquatic Resources (Fisheries)

3.4.1 Affected Environment

Fish and wildlife in the State of Idaho are managed exclusively by IDFG per state Statute Title 36 (IDFG 2019b), and IDFG staff are considered the subject matter experts for fish populations in the affected environment for this project. The potential affected environment overlaps the jurisdiction of three IDFG regions—Regions 4, 5 and 6.

Three geographically-distinct, but interconnected, fish communities exist within the area potentially impacted by the proposed action as follows:

1. Fish in the Snake River above American Falls Reservoir upstream to Palisades Dam
2. Fish in American Falls Reservoir
3. Fish in the Snake River below American Falls Dam downstream to Walcott Lake

There are no federally listed fish species in the area of potential effect (Section 3.5); however, these three fish communities include species of interest, such as the native cutthroat trout, introduced white sturgeon, and warm- and cool-water recreational sport fisheries (Section 3.7). They are maintained in large part through operations at American Falls reservoir that incidentally support fisheries by allowing optimal rates of entrainment (fish being passed through the dam), and limiting instances of low DO concentration and/or high concentrations of TDG in the river downstream of the dam. Conditions that allow a beneficial amount of entrainment occur when reservoir volume is at 15 to 30 percent of full pool (IDFG 2018). The key components of the affected environment for each distinct fish community include a sufficient prey base, water quality (see Section3.3, access to seasonally important habitat, and the effects of entrainment through American Falls Dam. Each of these are described below.

Snake River Above American Falls Reservoir Upstream to Palisades Dam

Prey Base

This section of the Snake River supports the nation's largest population of native cutthroat trout, as well as healthy populations of rainbow and brown trout, portions of which seasonally migrate within the river upstream of American Falls Reservoir (a fluvial life history), and between the river and the reservoir (an adfluvial life history). Adfluvial migratory fish overwinter and rely on the abundant prey base that generally exists in the reservoir.

Water Quality

Water quality in this section of the Snake River supports a blue ribbon fishery of extremely high quality (Section 3.7). Favorable water quality parameters such as seasonal flows, water

temperatures, and low sediment contribute to the maintenance of a high quality recreational fishery with greater fish abundance and larger-sized fish than in other areas. This area is managed by IDFG as a Special Rule area.

Access to Habitat

Releases from Palisades Reservoir regulate water levels in American Falls Reservoir, and influence the water temperature and accessibility of shallow shoreline habitat along the Snake River corridor between the two facilities (Moller and Van Kirk 2003; Hauer et al 2004). Brown trout spawn during October and November in the Snake River between Palisades Dam and American Falls Reservoir and use select shallow shoreline areas, which makes them and their nests susceptible to the effects of fluctuating water levels. Reservoir drawdowns can create seasonal migration barriers at the point where a river enters a reservoir (Prisciandaro 2015) because of the deposition of fine material that accumulates at this point. When American Falls Reservoir is drawn down, this fish population may experience this type of temporary migration barriers between the river and American Falls Reservoir.

American Falls Reservoir

Prey Base

The reservoir supports populations of both warm and cool water fish species, but is most notable for its sport fishing (Section 3.7) of several species of trout (IDFG 2019a). An abundant and self-sustaining prey base for trout and the other game fish exists in the reservoir, which allows these populations of popular sport fish to live longer and grow larger than fish that live strictly in a river environment. The prey base is mainly composed of small sized fish of all species, and includes native and introduced fish species, aquatic insects, and zooplankton. Current operations of American Falls Dam and Reservoir support the present diversity and abundance of the prey base in the reservoir.

Water Quality

American Falls Reservoir seasonally stratifies through the spring and summer, and then re-mixes in the fall. When stratified, the epilimnion (upper water layer) tends to be well oxygenated, while the hypolimnion (lowest level water) generally contains low to no DO at the end of the summer until the stratified layers naturally turn over and become mixed again in the fall. High storage levels leading into the late-summer to fall period can inhibit full fall mixing of the seasonally-stratified water layers, which prolongs poor water quality conditions in parts of the water column.

Water quality conditions in American Falls Reservoir are primarily tied to storage volume and weather conditions, as described in Section 3.3. Current operations, as described in Section 3.2, typically maintain American Falls Reservoir at levels that provide suitable water quality conditions that support the current fisheries. In hot, dry years when American Falls Reservoir is seasonally at its lowest pool level, direct fish mortality can occur due to

increased water temperatures, increased sediment mobilization, low DO, or compounding effects resulting from a combination of these water quality parameters (Section 3.3.

Reservoir pool volumes of less than 100,000 acre-feet (approximately 6 percent of full pool) most recently occurred in 2013 when American Falls Reservoir was drafted to just over 50,000 acre-feet, resulting in reduced water quality and limited access to habitat.

Access to Habitat

The reservoir provides important over-wintering habitat for migratory trout that use the Snake River upstream of the reservoir for spawning and rearing habitat during the spring and summer. Without the reservoir to provide prey for overwintering fishes and a migration corridor to critical spawning and summer habitat, neither fish community would sustain their current populations or recreational interest (Section 3.7). Reservoir drawdowns can create seasonal migration barriers at the point where a river enters a reservoir (Prisciandaro 2015) because of the deposition of fine material that accumulates at this point. Temporary migration impediments through the river delta at the top of the reservoir, where the Snake River enters American Falls Reservoir, occur when the reservoir is seasonally at its lowest pool level.

Reservoir drawdowns reduce the quantity of habitat available for the fish community in the reservoir. Reduced habitat increases predation and competition for available resources, and can stress fish causing prolonged effects.

Entrainment

Entrainment occurs at some level in all operating scenarios, and results in losses to the populations of all fish species present in the reservoir. Too high a level of entrainment loss at any trophic level can cause effects that cascade through each level of the food chain. The loss of too many mature fish could lead to a longer recovery time for the population since fewer mature fish would be present to reproduce. However, entrainment generally serves an important role for the reservoir fish community. Fish losses through entrainment help to balance the reservoir fish community and maintain a healthy prey base in the reservoir.

An optimal entrainment level that maintains a predator/prey balance in the reservoir occurs when reservoir volumes are between 15 percent and 30 percent of full pool (Teuscher 2019). When reservoir pool elevations do not drop below 30 percent annually, entrainment is decreased. A decrease in entrainment can cause fish populations to become overcrowded. In dry years when the reservoir volume drops below 15 percent of full pool, entrainment losses have increased beyond a level that sustains balance in the reservoir fish community. Entrainment resulting from normal operations maintains a fish community that is balanced and appropriately sized for the quantity of habitat typically available.

Snake River Below American Falls Dam Downstream to Milner Dam

This section of the Snake River supports popular fisheries of the same species as found in American Falls Reservoir, as well as an introduced population of white sturgeon (also discussed in Section 3.5). Due to very little spawning habitat for all species in this reach, these fisheries are not maintained through natural reproduction. Therefore, these fisheries are reliant on the high survival of fish entrained from American Falls Reservoir to replenish and maintain the populations of sport fish and their prey. Similar to the migratory behavior of fish in the Snake River above American Falls Reservoir, fish in this section also exhibit fluvial and adfluvial migratory behavior, including seasonal use of Lake Walcott.

Prey Base

The prey base that exists in this stretch of the Snake River is composed similarly to that found in American Falls Reservoir, and is a result of entrainment.

Water Quality

Releases from American Falls Reservoir directly influence water quality and quantity in the river downstream of the dam. This section of the Snake River is not typically water quality limited. Instances of reduced water quality that have measurable effects to the fish populations in this reach are uncommon, and are mostly avoided through preventative operations. However, in hot, dry years when American Falls Reservoir is seasonally at its lowest pool level, receiving water may be affected by conditions in the reservoir, including increased water temperatures, increased sediment, low DO, or compounding effects resulting from a combination of these water quality parameters (Section 0).

Seasonal occurrence of lowered DO concentrations is an infrequently occurring, but known water quality concern below the dam (Section 0). The amount of DO that a given volume of water can hold is a function of atmospheric pressure, water temperature, and the amount of other substances dissolved in the water. Temperature can strongly influence DO levels because temperature establishes a maximum oxygen holding capacity of water. High water temperatures (86 °F or higher) reduce the holding capacity of water. In hot, dry years, receiving waters from American Falls Reservoir are warmer and have lowered DO concentrations, which can result in low DO concentrations in the Snake River immediately below the dam.

As DO levels in water drop below 5.0 mg/l, aquatic life is put under stress. The lower the concentration, the greater the stress, up to and including mortality. Reduced water quality conditions such as DO concentrations that remain below 1-2 mg/l for a few hours can result in large fish kills. Mitigative measures implemented by Idaho Power, such as the use of aerators below the dam and use of spill to introduce aerated water (see Section 0) have historically been largely successful at preventing sustained drops in DO concentrations and their related effects to fish in this area of potential effect. Most recently, this type of direct

fish mortality from low DO concentrations occurred in the summer of 2018 (Idaho State Journal 2018).

Access to Habitat

Migration barriers in this reach of the Snake River do not typically exist. Seasonal barriers to migration in and out of Lake Walcott may occur, but are not known to be limiting.

Entrainment

The current fish community in this section is reliant on the high survival of fish entrained from American Falls Reservoir to replenish and maintain populations of sport fish and their prey. Entrainment loss from these populations also occurs from Lake Walcott (through Minidoka Dam). Current operations at Lake Walcott minimize this entrainment.

3.4.2 Environmental Consequences

Methods and Criteria

Effects were evaluated by a combination of the following:

1. Contacting IDFG fish biologists and/or managers from each region for advisement;
2. Querying publicly available information on the characteristics and value of all three fisheries;
3. Performing a literature search of scientific peer reviewed information for the affected area; and
4. Assessing the likelihood and magnitude of potential effects to determine their level of significance.

Alternative A – No Action

Direct and Indirect Effects

Effects to prey base, water quality, access to habitat, and entrainment throughout the area of potential effect would remain similar to conditions present under normal operations, as described in the preceding Affected Environment section.

Fish in the Snake River above American Falls and in American Falls Reservoir would continue to experience partial seasonal barriers to migration when American Falls Reservoir is at its lowest seasonal volume. Fish in American Falls Reservoir and in the Snake River below American Falls Dam would generally continue to be supported by a prey base that is balanced by entrainment. Fish in the Snake River below American Falls Dam would continue to experience minimized entrainment losses through Minidoka Dam. Fish in all three communities would continue to experience suitable water quality conditions, except when hot dry climate conditions result in low water levels and degraded water quality in the reservoir and downstream.

Under the no action alternative, hot, dry conditions could cause direct negative effects to the reservoir fish community due to increased turbidity created by low water volumes, increased entrainment, and the compounding effect of seasonal migration barriers due to low water levels (fish seeking more favorable habitat are unable to move out of the reservoir). This could result in increased mortality of fish in the reservoir, increased entrainment, or stress that could lead to indirect effects such as reduced fitness, overcrowding, and reduced reproductive success. These types of effects to the reservoir fish population from normal operations under hot, dry conditions occurred most recently in 2013 when American Falls Reservoir was drafted to just over 50,000 acre-feet. At this time, a period of degraded water quality conditions combined with increased entrainment in American Falls Reservoir led to measurable reductions to the reservoir fish community (Teuscher 2019). These conditions, when they occur, also affect the fish community downstream of the dam due to the degraded quality of water being released from American Falls Reservoir.

Under the no action alternative, hot, dry conditions could also cause direct negative effects to the fish community in the Snake River below American Falls Dam. In these climactic conditions, receiving waters from American Falls Reservoir are warmer and have lowered DO concentrations, which can result in low DO concentrations in the Snake River immediately below the dam.

The interaction of effects from reduced water quality coupled with low reservoir volume can be observed for many years depending on the severity and duration of periods of elevated mortality to the reservoir fish community. An analysis of age and growth data for the reservoir fish community indicates it takes as long as 8 years for smaller fishes to achieve maturity, at which point the population exhibits a balanced age structure allowing for annual recruitment at a level that replaces losses (Kohler and Hubert 1993). Based on this information as well as historical data, recovery of the fish communities both in the reservoir and in the Snake River below the dam to pre-event levels following a measurable loss under normal operations would be expected to take up to 8 years.

If the proposed maintenance is not performed and the spillway and dam structures continue to experience degradation, the spillway could become unusable at some point in the future. This would limit Reclamation's operational flexibility to use spill to counter the effects of degraded water quality that can occur under normal operations due to hot, dry conditions (i.e., low DO concentrations downstream from the dam).

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

The proposed action would maintain overall operations within their normal historic range (Section 3.2), with the exception of limiting operational flexibility to use spill as a means of

water passage during construction. This limited flexibility could affect the fish populations throughout the area of potential effect in the following ways:

Snake River Above American Falls Reservoir Upstream to Palisades Dam

The proposed action would potentially cause minor alterations to the magnitude or timing of releases from Palisades Reservoir, as the upper Snake River storage facilities upstream of Milner Dam are operated as a system for overall water management. However, these changes would not fall outside the historic range of operations. Therefore, the proposed action would have no measurable effect to the condition of the prey base, water quality, or habitat present in the Snake River above American Falls Reservoir. Since the adfluvial portion of this fish population is seasonally dependent upon the prey base in American Falls Reservoir and could also be subject to entrainment while in the reservoir, effects to this population have been included in discussion of effects to fish in American Falls Reservoir.

American Falls Reservoir

As discussed in the affected environment section, when hot, dry conditions occur, this could cause a reduction in the prey base, and affect all fish in the reservoir through the effects of low water levels (degraded water quality, increased turbidity, increased entrainment, and temporary migration barriers). The limited operational flexibility during spillway construction could contribute to these effects, if the necessary additional late-season water releases were to lower the reservoir volume below 15 percent. These effects would be compounded if similar climatic conditions occurred during both years of the proposed project. This scenario has been considered when formulating planned system operations of the upper Snake River storage facilities upstream of Milner Dam and would be unlikely to occur due to the operations described in Section 3.2. These operations would specifically target maintenance of American Falls Reservoir at or above 15 percent full at the end of each construction period. Therefore, the degree to which overall potential effects of operations on prey base could be attributed to the proposed action is minimal.

Snake River Below American Falls Dam Downstream to Milner Dam

Effects to prey base and access to habitat in this part of the area of potential effect would be the same as those under the no action alternative. The proposed project would not cause any additional significant effects.

In a hot, dry year, the proposed project could have effects to water quality. As discussed in the affected environment section, when hot, dry conditions occur, this could lead to low water levels in American Falls Reservoir, which results in increased sediment mobilization and turbidity in water that is then discharged into the Snake River below the dam. These effects are known to become significant when the reservoir is drafted below 100,000 acre-feet (approximately 6 percent of full volume) (Appendix B). However, this would be unlikely to occur during the proposed action due to the operations described in Section 3.2, which would specifically target maintenance of American Falls Reservoir at or above 15

percent of full pool (250,000 acre-feet) at the end of each construction period. Therefore, there would be no expected project effects to turbidity in the Snake River below the dam.

There have been isolated instances where DO concentrations could not be maintained at the IDEQ minimum level for compliance without using mitigative spill. This most recently occurred in late summer of 2018 and was likely caused by the combination of conditions including algae population collapse, a series of overcast days, and high winds pushing low oxygenated water toward the dam intake (Grossarth 2018). Both blowers were unable to raise DO concentrations, requiring spill. Spill was not initiated until 2 hours after the incident occurred. If similar conditions were to occur during the proposed action, the limited operational flexibility during in-waterway construction could contribute to an increase in the duration of low DO concentrations, which would have direct effects to fish in the Snake River below the dam.

However, the mitigative measures to be implemented as a part of the proposed action—preventative early-season water level management in American Falls Reservoir; ongoing predictive water quality monitoring above and below American Falls Dam; as-needed use of three additional aerators; and the ability upon a 48-hour clearance notification to initiate spill if warranted by extreme conditions, as discussed in Section 3.3 and detailed in Appendix D—are expected to minimize any additional effects to DO concentrations potentially attributable to the proposed action. The effects of low DO generally do not rise to the level of measurable fish kills until DO concentrations remain below identified state standards for a sustained period, unless water temperatures are very warm. During the proposed project, a series of mitigative measures would be implemented when monitoring data indicates a lowering trend approaching state instantaneous minimum standard of 3.5 mg/L, initiated well before DO concentrations have violated state standards. Therefore, because the type, magnitude, and probability of effects to fish from periods of low DO concentrations would be expected to be similar to those under the no action alternative, the proposed project would not be expected to cause measurable effects to the fisheries downstream of American Falls Dam.

Use of additional aerators is not without potentially confounding issues. Use of all five aerators could create a risk of elevating TDG above the state threshold criteria for aquatic life (110 percent saturation). This water quality parameter would be monitored continuously by IDEQ, and mitigative operations would be adjusted to preventatively address trends in TDG before they violate state standards or cause direct effects to fish. Measurable effects to fish from TDG are not anticipated.

Entrainment of this fish population could be slightly affected by the proposed project. The early season drawdown of Lake Walcott to create storage space could temporarily increase the entrainment of fishes through Minidoka Dam. However, due to the limited duration of these drawdown periods (beginning in September and ending by October 15, with Lake Walcott expected to be refilled by November 23 in both construction years), overall effects to year-round entrainment levels at this dam would be minimal.

3.4.3 Cumulative Effects

None of the actions considered for cumulative effects (Section 2.6) have had or are expected to have direct or indirect effect to fisheries in the area of potential effect. Therefore, no cumulative effects of the proposed project are expected.

3.4.4 Mitigation

Mitigative measures are incorporated into the proposed action that would help to reduce the severity or eliminate potential effects to fish communities. These mitigation measures are discussed in detail in Section 3.2 of this document, and include:

1. System operations planning that would target maintaining reservoir storage in American Falls Reservoir above 15 percent of full pool, in order to minimize the potential for degraded water quality and excessive entrainment
2. Monitoring of DO concentrations in the reservoir and below the dam to predict low DO events, aeration of water in the Snake River immediately below American Falls Dam through the use of portable aerators, and/or use of spill to maintain DO levels in compliance with state standards

3.5 Threatened and Endangered Species

3.5.1 Affected Environment

A corridor along the Snake River from American Falls Reservoir downstream to Lake Walcott, extending through Blaine, Power, and Cassia Counties in Idaho was delineated for analysis. This downstream area was identified as the area of potential effect because the proposed action would affect the configuration of water operations at American Falls (discussed in Sections 3.2 and 0 of this document), creating the potential for effects to downstream water quality in the stretch of the Snake River between American Falls Dam and Lake Walcott. Since the management of American Falls Reservoir and Lake Walcott would fall within the range of normal operations regardless of which alternative is selected, analysis did not include the areas surrounding the reservoirs (i.e., the shoreline and littoral zone, or area from the high water mark down to the lowest point of inundation during seasonal drawdown). Downstream riparian (terrestrial) habitat would also not be expected to be affected, since overall flows below American Falls would remain within the range of normal operations. A preliminary report generated through the U.S Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) site indicated no listed species are expected to be present in the action area for this proposed project, and no proposed or designated critical habitats associated with any listed species overlap with the project's area of influence. This report is included as Appendix G.

Snake River physa (*Physa natricina*) is an endemic species of aquatic snail that is listed as endangered, and is known to exist only in a limited stretch of the Snake River immediately below Minidoka Dam. The complete range of physa is not well defined, but they are not believed to exist above Lake Walcott. In its 2015 Biological Opinion issued to Reclamation for the potential effects to the species from operation and maintenance of Reclamation facilities on the Snake River above Brownlee Reservoir, USFWS identified that adverse effects to Snake River physa may result from sediment mobilization and transport from American Falls Reservoir and/or Lake Walcott over the Minidoka Dam spillway (USFWS 2015). Specifically, summer drafting of American Falls Reservoir below low pool (<100,000 acre feet) accompanied by drafting of Lake Walcott is identified in the Biological Opinion as a scenario that would be likely to result in adverse effects to the species.

One notable fish species present in the Snake River below American Falls is the white sturgeon (*Acipenser transmontanus*). Wild populations of white sturgeon are federally listed as endangered throughout their range. However, the sturgeon that are present below American Falls Dam are not naturally occurring, but rather have been periodically stocked by IDFG to provide for a popular and unique sportfishing opportunity. The first IDFG release of sturgeon below the dam occurred in 1989. This population is believed to consist entirely of planted individuals (it is geographically isolated from wild populations and is presumed to be non-reproductive due to a lack of favorable conditions for spawning). The population is managed as a strictly catch-and-release fishery, and is tracked and monitored via tagging and recapture data gathered by IDFG biologists and self-reported by anglers (IDFG 2018). Due to the anthropogenic origin and non-reproductive, isolated characteristics of this population, it has been excluded from the ESA protections that are applicable to naturally-occurring populations. Potential effects to the sturgeon population downstream from American Falls Dam are therefore not analyzed under effects to threatened and endangered species, but are discussed in terms of general effects to fisheries in Section 3.4 of this document.

3.5.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

Current aquatic and riparian habitat conditions would remain unchanged under the no-action alternative. Since no proposed, threatened, or endangered species or their associated proposed or designated critical habitats are known to be present in the action area, there would be no effect to threatened and endangered species.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

Due to the absence of any federally proposed or listed species or proposed or designated critical habitats in the area of potential effect for the proposed action and the fact that the water management strategy for the proposed action does not include drafting of American Falls Reservoir near or below 100,000 acre-feet, it is not anticipated that the proposed project would have any effect to any species listed as threatened or endangered, or to any designated critical habitats for threatened or endangered species.

3.5.3 Cumulative Effects

Due to the absence of any federally proposed or listed species or proposed or designated critical habitats in the area of potential effect for the proposed action, there would be no cumulative effect to threatened or endangered species from this action.

3.5.4 Mitigation

In the absence of any federally proposed or listed species or proposed or designated critical habitats in the area of potential effect for the proposed action, no mitigation would be necessary.

3.6 Noise

This section defines noise, describes the existing noise setting in the proposed action area, and identifies potential sensitive receptors. It then evaluates the effects of the construction noise on sensitive human noise receptors and identifies mitigation measures to minimize those effects.

3.6.1 Affected Environment

For this assessment, noise is defined as unwanted sound that is objectionable because it is disturbing or annoying due to its pitch or loudness. Pitch is the height or depth of a tone or sound. Higher-pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the intensity of sound waves combined with the reception characteristics of the ear.

A decibel (dB) is a unit of measurement that is used to indicate the relative amplitude of a sound. Sound levels in decibels are calculated on a logarithmic scale. Subjectively, each 10-dB increase in sound level is generally perceived as approximately a doubling of loudness. In general, there is a perceived sound level drop of 6 dB per doubling of distance. Technical terms are defined in Table 1.

Table 1. Noise-related terminology and definitions

Term	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-weighted sound level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1, 10, 50, and 90 percent of the time during the measurement period.
Equivalent noise level, L_{eq}	The average A-weighted noise level during the measurement period.
Community noise equivalent level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Day/night noise level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient noise level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Illingworth and Rodkin 2006

There are several methods of characterizing sound. The most common is the A-weighted sound level or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common

averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

Table 2. Representative outdoor and indoor noise levels (in units of dBA)

Noise Source and Distance from Noise Source	A-Weighted Sound Level in Decibels	Comparable Noise Level (common settings)	Listener's Subjective Impression and Effect to Hearing
---	— 140 —	---	---
Civil Defense Siren (100 feet)	— 130 —	---	---
Jet Takeoff (200 feet)	— 120 —	---	Pain Threshold
---	— 110 —	Rock Music Concert	---
Diesel Pile Driver (100 feet)	— 100 —	---	Very Loud Hearing Damage After 15 Minutes Exposure
---	— 95 —	---	Repeated Exposure Risks Permanent Hearing Loss
Heavy Truck (50 feet)	— 90 —	Boiler Room	Very Annoying Hearing Damage (8 hours)
Freight Cars (50 feet)	---	Printing Press Plant	---
Pneumatic Drill (50 feet)	— 80 —	---	Annoying, Intrusive Interferes with Conversation
Freeway (100 feet)	---	In Kitchen with Garbage Disposal Running	---
Vacuum Cleaner (10 feet)	— 70 —	---	Moderately Loud Intrusive, Interferes with Telephone Conversation Noise Begins to Harm Hearing
---	---	Data Processing Center	---

Noise Source and Distance from Noise Source	A-Weighted Sound Level in Decibels	Comparable Noise Level (common settings)	Listener's Subjective Impression and Effect to Hearing
Air Conditioning Unit (20 feet)	— 60 —	---	Intrusive
---	---	Department Store	---
Light Traffic (100 feet)	— 50 —	---	---
Large Transformer (200 feet)	---	Private Business Office	---
---	— 40 —	---	Quiet
---	---	Quiet Bedroom	---
Soft Whisper (5 feet)	— 30 —	---	Very Quiet
---	---	Recording Studio	---
---	— 20 —	---	---
---	— 10 —	---	Threshold of Hearing
---	— 0 —	---	---

Source: Illingworth and Rodkin 2006; OSHA 2006

Effects of Noise

Hearing Loss

Acoustic trauma is injury to the hearing mechanisms in the inner ear due to very loud noise. Hearing loss can occur due to chronic exposure to excessive noise, or may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration's (OSHA) noise exposure standard is set at the noise threshold at which hearing loss may occur from long-term exposures. OSHA's maximum allowable level is 90 dBA, averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter. Under OSHA noise exposure standards, workplace hearing conservation measures are required at 85 dBA for an 8 hour day, and feasible engineering or administrative noise controls are required when exposures exceed 90 dBA.

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors, the thresholds are about 15 dBA higher. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA affect sleep.

Annoyance

Attitude surveys have determined that common noise-related causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. An L_{dn} of 60 dBA is perceived as highly annoying by approximately 10 percent of the population. Each decibel increase to 70 dBA adds about 2 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increases results in about a 3 percent increase in the percentage of the population highly annoyed.

Existing Noise Levels

Sensitive receptors for noise are defined as people at various locations who are participating in activities for which low noise levels are important (e.g., activities conducted at residences, hospitals, schools, libraries, recreational areas, and places of worship). The only sensitive noise receptors near American Falls Dam are several nearby residences. The closest private residences are approximately 300 feet east of the construction zone, located on Bridge Street. These residences are situated between SH-39 and the Union Pacific railroad tracks, approximately 100 feet from the highway and under 200 feet from the railroad tracks.

American Falls Dam is located on the outskirts of the town of American Falls, in a primarily rural, agricultural area. Background noise levels in rural areas typically range between 35 and 45 dBA. Background noise levels are approximately 40 dBA in rural residential areas and 45 dBA in agricultural cropland with equipment operating.

The primary sources of noise in the rural residential and agricultural areas near American Falls Dam include hydrogeneration and dam operation noise, highway and railroad traffic, and boating and farm machinery on a seasonal basis. Ambient noise levels in the reservoir area outside the immediate areas of the dam are low. Noise sources in these areas are predominantly natural, including insects, birds, wind, flowing water, and weather.

3.6.2 Environmental Consequences

The potential noise effect associated with American Falls Dam, with or without the Proposed Action, is the temporary disturbance resulting from noise generated by equipment and machinery used during construction. Construction hours would likely range from 8 to 12 hours per day. Reclamation does not anticipate any 24 hour workdays. Therefore, only daytime effects are described. There are no Federal noise regulations pertaining to the Proposed Action. Noise level estimates for specific construction equipment at various distances are shown in Table 3.

Table 3. Standard construction equipment noise levels (dBA) of equipment to be used in the Proposed Action, as measured at varying distances from the noise source

Equipment		Distance from Source of Noise			
Type	**Specific Equipment**	**25 Feet**	**50 Feet**	**100 Feet**	**200 Feet**
Earth/Material Moving Equipment	Front-loaders	85	79	73	67
	Backhoes	91	85	79	73
	Trucks	97	91	85	79
Materials Handling Equipment	Concrete pumps	82	76	70	64
	Cranes (movable)	89	83	77	71
	Concrete mixers	91	85	79	73
Stationary Equipment	Pumps	82	76	70	64
	Generators	82	76	70	64
	Compressors	87	81	75	69
Impact Equipment	Pneumatic wrenches	91	85	79	73
	Jackhammers and rock drills	94	88	82	76
Other	Vibrator	82	76	70	64
	Saws	84	78	72	66

Abrasive blasting/hydroblasting noise levels come from a combination of sources, including air compressors and discharge from the blast nozzle. Noise levels for compressors is given in Table 3. Abrasive blasting/hydroblasting noise levels measured at the discharge nozzle range from 112 to 119 dBA (OSHA 2006).

American National Standards Institute Section A10.46-2007, Hearing Loss Prevention in Construction and Demolition Workers, applies to all construction and demolition workers with potential noise exposures (continuous, intermittent, and impulse) of 85 dBA and above.

Noise effects would be considered significant if the project would:

- Cause a *substantial permanent increase* in ambient noise levels in the project vicinity above levels existing without the project; and/or
- Cause a *substantial temporary increase* in ambient noise levels in the project vicinity above levels existing without the project.

Alternative A – No Action

Under the No Action alternative, the American Falls Dam structure would remain in service in its current configuration and would continue to deteriorate. As the concrete continues to deteriorate, maintenance requirements would increase.

Maintenance Effects

Noise levels associated with maintenance activities would vary based on the numbers and types of equipment used. As shown in Table 3, typical noise levels of individual pieces of construction equipment range from 80 to 107 dBA at a distance of 25 feet, and 62 to 89 dBA at a distance of 200 feet. Noise levels from all maintenance construction activities would have attenuated to acceptable levels at the private residences. Noise effects associated with ongoing maintenance construction inherent to this alternative would be temporary and minimal.

Alternative B – Proposed Action

Construction Effects

Under Alternative B, construction would occur over the spring/summer/fall months over 2 years, and require hydrodemolition and the use of equipment such as trucks, cranes, generators, and pumps. Work is expected to occur 8 to 12 hours a day and be conducted Monday through Friday at the discretion of the contract awardee. Work schedules would be subject to review and approval by Reclamation. The engines and motors associated with the equipment would temporarily elevate noise levels in the construction zone and the reservoir, and potentially extend to the residences near the site. As shown in Table 3, typical noise levels of individual pieces of construction equipment range from of 80 to 90 dBA at a distance of 25 feet, lowering to 62 to 79 dBA at a distance of 200 feet. Because of the distances between the residences and the project area, noise levels from all construction zone activities would have attenuated to acceptable levels at private residences.

It is anticipated that hydroblasting would be required to remove concrete from the existing structures. Noise levels at the discharge nozzle range from 112 to 119 dBA (OSHA 2006). These noise levels would dissipate at a rate similar to other sources, and be expected to be below the annoyance level of 70 dBA before they reach the park or local residences.

Personnel working in the facility are already regularly exposed to elevated noise levels and follow industry-standard protocols for hearing protection while at their job sites. Those entering the construction zone would be required to use hearing protection appropriately rated for the expected noise levels of the area.

Noise effects associated with construction of this alternative experienced by personnel working at the dam facilities and by members of the public at the park and private residences would be temporary and minimal.

Operational Effects

Noise levels would remain unchanged from current conditions; therefore, there would be no operational effects.

3.6.3 Cumulative Effects

No cumulative effects are anticipated, as the other projects described in Section 2.6 of this document are scheduled for years other than those in which the proposed project would take place. Additionally, much of the powerplant overhaul work is being conducted indoors, meaning any external noise would be dissipated by the powerhouse structure.

3.6.4 Mitigation

Section 8 of Reclamation's Safety and Health Standards provides general requirements for hearing protection, which would be followed during completion of the proposed work. Section 8.4.2 "Hearing Protective Devices" states, "Use hearing protective devices (properly inserted ear plugs or ear muffs) whenever ambient noise levels equal or exceed 85 dBA. Hearing protection provided would be capable of reducing employee noise exposure below an 8 hour [Time Weight Average] of 85 dBA."

3.7 Recreation

3.7.1 Affected Environment

Visitor numbers for American Falls Reservoir and the entire area of potential effect are unknown. Numbers captured by recreation managing partners on recreation use data reports are primarily from campsite sales. In 2016, this number exceeded 66,000 instances of recreation use sales for the area surrounding American Falls Reservoir. The reservoir has a large draw of boaters from northern Utah and tourists traveling to Yellowstone.

Fishing (both shoreline and from boats), water sports, and picnicking are the most popular recreation activities at American Falls Reservoir. Access to the reservoir and beach for public recreation is a vital link to economic support of surrounding communities that provide gas, food, goods, services, lodging, and additional recreation opportunities. The reservoir fishery is largely used by boat anglers. Boat ramps are only accessible at reservoir storage levels greater than 22 percent of full pool. If the reservoir is drafted below 22 percent, then boat anglers would not have access.

Sport fish present in American Falls Reservoir include rainbow trout, cutthroat trout, brown trout, largemouth bass, smallmouth bass, and yellow perch. Trophy fish are common in the reservoir. The popular sport fisheries target the older, larger individuals relative to younger, smaller fishes. Based on age and growth data, it may take up to 7 to 8 years for smaller fishes to achieve these sizes.

The fisheries in the reservoir have produced seven catch and release records for the State of Idaho (IDFG 2019a). The popular trout fisheries on the Snake River both upstream from American Falls Reservoir and downstream from American Falls Dam are considered "blue ribbon" fisheries. A non-reproductive, introduced population of white sturgeon is present in the Snake River below American Falls Dam, which is also a popular fishing target. Effects to aquatic resources and fisheries are discussed in more detail in Section 3.4 of this document. This section discusses only the effects to recreation use and users.

Most of the recreation-based businesses, such as licensed outfitters that operate within the action area, are fishing-related. The west side beach—extending from just north of West Boat Ramp to the dam—is the most popular beach on the American Falls Reservoir and the section closest to the dam is considered the best for shoreline fishing. Year-round beach access is a public priority. Prior to rehabilitation of the boat ramp in 2018, the beach was easily accessed by vehicles and pedestrians via the west side boat ramp as water receded. Rehabilitation of the ramp included raising the height of the ramp, and placement of large rip rap along the edge for stabilization. This currently prevents all vehicle entry and makes pedestrian access to the beach difficult. Fishing from the ramp and docks is prohibited for safety. Pedestrian access to the beach partially via haul roads is still possible, but is made difficult by the rip rap. There has been considerable public complaint about the loss of beach access that has occurred over the past 2 years. Reduced access at the ramp has displaced more shoreline fishermen and beach users to the West Wall recreation site at the dam where fishing is better, but it is difficult for pedestrians to get to the beach. These locations are shown in Figure 8.

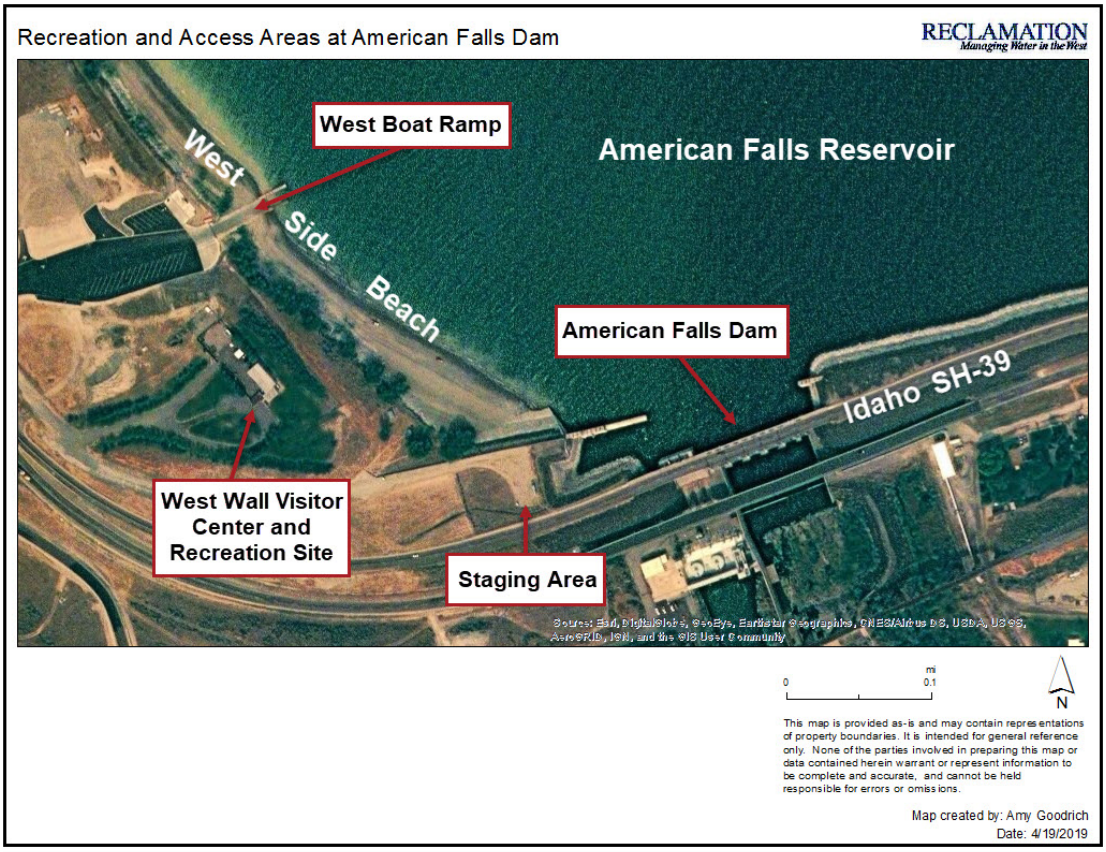

Figure 8. Locations of discussed American Falls Reservoir recreation areas and staging site at American Falls Dam.

The West Wall recreation site is directly managed by Reclamation. It is accessed from the aggregate parking area at the top of the dam that is located at the end of the old abandoned highway right-of-way just past the administration site and visitor center. Parking in this area is often limited in the summer and fall. Funding has been requested to rehabilitate this site to meet public safety and health standards beginning in 2021.

Developed recreation sites surrounding the reservoir (aside from those areas within tribal boundaries and/or managed by the tribes) are primarily managed by recreation partners. Most campers with boats will camp at those campgrounds and launch from those sites.

3.7.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

Under the no action alternative, current recreational access and conditions would remain the same. Recreators would continue to experience limited pedestrian access at West Side

Beach, with many using the limited parking at the West Wall recreation site. Boating and camping access would remain unchanged from current conditions.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

Public Access

It is difficult to determine what percentage of visitors participate in water-based activities, but some would potentially be affected by the proposed action. The parking area at the West Wall is identified as a staging area for the dam repairs. Closure of this access during the proposed project would further displace fisherman and beach users. Access to shoreline fishing and picnicking at the west side beach area would be directly affected during construction periods, and possibly during non-construction periods depending on the configuration of the staging area closure at the top of the dam. Loss of access is notable as the project would increase the recent significant loss of beach access and could further restrict access opportunities of users already displaced by the reconstruction of the West Boat Ramp Recreation Area.

Pedestrian access to shoreline fishing and beaches at the west side would be limited during the construction period, and would be likely to cause increased complaints from local recreation users further displaced for an extended period. However, due to the limited timeframe of the project and the fact that all access temporarily restricted for staging areas and other project activities would be restored upon completion of the project, these effects to recreation access would not be significant. There is no expectation that boating access to the reservoir or beach would be affected by the project.

Access to the shoreline on the Snake River, both above and below the reservoir, could vary according to water levels during the project, but changes to the releases from American Falls Dam during the proposed project would not vary outside the historic range of operations, and would not be expected to result in any measurable effects to recreators.

Fisheries

A change to any of the populations in American Falls could potentially affect trout fisheries in the reservoir, upstream, and downstream for up to 8 years (see Section 3.4 for a more detailed discussion of how the fish populations throughout the area of potential effect are interconnected). However, significant effects to fisheries are not anticipated as a result of the proposed action (Section 3.4).

Recreation Outfitting

If the fishery is significantly affected over a long period of time (see Section 3.4), the quantity and quality of recreation opportunities would also be affected. Fishing outfitters and guides would be impacted economically by loss of revenue and relocation costs. However,

significant effects to fisheries are not anticipated as a result of the proposed action (Section 3.4).

Land-based hunting and commercial outfitter and guide operations in the hunting areas adjacent to the river corridor and reservoirs would not likely be affected by the proposed action because no long-term reduction or loss of non-aquatic wildlife would occur.

3.7.3 Cumulative Effects

Recent loss of some degree of pedestrian access makes further restriction caused by the proposed action, even if temporary, likely to be perceived negatively. Until pedestrian access to the beach and shoreline is adequately restored and improved, an increased number of complaints from the public would be expected. However, due to the limited timeframe of the proposed project and the fact that all access temporarily restricted for the creation of staging areas, etc. would be restored upon completion of the project, the proposed project would not cause any significant cumulative effects to recreation access.

3.7.4 Mitigation

Public outreach in the form of roadway announcements (see Section 3.8) and signage at temporarily restricted areas would be used to direct users to other nearby points of access.

3.8 Transportation

3.8.1 Affected Environment

American Falls Dam is in Power County, Idaho directly west of the City of American Falls with a population of 4,457 (Census Bureau 2010). Idaho SH-39 westbound lanes are located on top of the dam structure, SH-39 eastbound lanes are located on the lower road (bridge) downstream of the dam. SH-39 is located in Power and Bingham counties in Idaho. SH-39 is 52.924 miles (85.173 km) long and runs from its southern terminus at Interstate 86 (I-86) in American Falls to its northern terminus at U.S. Route 26 in Blackfoot. Between the two cities, it passes through the city of Aberdeen and the communities of Springfield and Pingree.

SH-39 is utilized by daily commuters from the cities of American Falls, Aberdeen, Springfield and Pingree. This highway is one of the main corridors from I-86 used by transportation trucks to access businesses west of the City of American Falls for loading and delivery. This includes Lamb Weston, Con-Agra, Trans System and the Amalgamated Sugar Company. In addition, this is the main thoroughfare for agricultural deliveries and equipment throughout the year, connecting areas west and east of American Falls Reservoir and the Snake River. Agricultural deliveries and equipment transportation typically increase from July to November annually to support harvest of local crops. This area of SH-39 is also used as one of the main routes to access recreational areas west of the City of American Falls

and the American Falls Reservoir including American Falls West Boat Ramp, recreational areas on the west side of American Falls reservoir, an area known by local recreators as Lake Channel, and recreational areas on the Snake River downstream of the dam. The average daily traffic volume ranges from 2,800 to just under 4,000 vehicles. Traffic data from 1994 to 2019 for this stretch of SH-39 are shown in Table 4.

Table 4. Average daily traffic volume by month 1994 to 2019. Showing results from 1-86B at milepost 101.275, 0.4 miles southeast of Marina Road, Segment Code 002332.

#078 - American Falls - ATR Average Daily Traffic Published Reports

Automatic Counter Volumes

Report Types

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	24-Hour	Annual Avg.
1994					2144	2424	2358	2178	2347	2298	1894	1666		
1995	1514	1706	1846	1960	2104	2293	2446	2272	2280	2434	2105	1665		2052
1996	1482	1711	2017	2183	2237	2646	2665	2624	2582	2638	2166	1719		2223
1997	1633	1822	2031	2345	2607	2839	2699	2610	2435	2401	2298	2087		2317
1998	1822	1837	2180	2487	2624	2749	2962	2858	2681	2734	2279	2074		2441
1999	1948	1862	2265	2475	2761	2962	2950	2681	2817	2959	2411	2112		2517
2000	2038	2196	2309	2584	2702	3005	3034	2878	2890	3079	2424	2149		2607
2001	2091	2078	2326	2627	2710	2934	2767	2685	2783	2847	2736	1945		2544
2002	1810	2085	2200	2603	2682	2781	2726	2710	2731	3118	2552	2279		2523
2003	2465	2312	2522	2812	2827	3170	3091	2962	3069	3075	2660	1900		2739
2004	2028	2226	2557	2857	2737	3001	2982	2800	3121	3012	2560	2380		2688
2005	2233	2492	2534	2799	2854	2977	3053	3017	2548					
2006					2789	3026	2999	3024	2971	3097	2879	2528		
2007	2532	2892	2758	2858	2980	3166	3144	3152	3155	3207	2922	2424		2933
2008	2360	2578	2494	2865	2854	2992	3052	2918	2929	2957		2206		
2009	2641	2504	2487	2926	2986	3075	3197	3080	3383	3380	2813	2539		2918
2010	2532	2866	2727	2927	2927	3258	3281	3096	3244	3388	2624	2527		2950
2011	2719	2751	2635	2962	1956	934	1806	2942	3420	3451	2947	2794		2610
2012	2833	2898	2852	3029	3018	3126	3063	3095	3335	3295	2969	2607		3010
2013	2507	2843	3097	3078	3055	3183	3812	3715	3782	3892	3218	2689		3239
2014	2939	2861	3192	3111	3117	3222	3220	3283	3609	3598	2951	2680		3149
2015	2746	3085	3215	3141	3156	3348	3227	3398	3542	3503	3202	2815		3198
2016	2894	3234	3178	3425	3442	3594	3479	3506	3833	3925	3570	2786		3405
2017	2513	2852	3497	3565	3601	3768	3662	3671	3751	3835	3442	2947		3425
2018	3031	2848	3223	3376	3382	3599	3349	3507	3612	3622	3426	2866		3320
2019	3066													

Source: ITD 2019

During April through November, traffic generally increases on SH-39 in support of the agricultural season as crops are planted, harvested and transported. In this area, potatoes, sugar beets, grain, barely, hay and straw are transported from various locations near American Falls Dam on this section of SH-39. There are multiple large processing plants

located west of the American Falls Dam including Lamb Weston and Con-Agra Food, both located within 3 miles of the dam structure and construction site. There is a large sugar beet storage area located nearby from which Trans System, Inc. and other local delivery trucks operate. Their transportation route from this site travels across the dam structure on SH-39.

It is not uncommon for traffic restrictions to be in place on SH-39 on or near the dam for maintenance and repairs completed by Reclamation or ITD. In the recent past, ITD completed maintenance on the SH-39 eastbound bridge directly downstream of the dam structure, which resulted in its closure for an extended period. All traffic was rerouted on SH-39 westbound lanes (across the dam) restricting eastbound and westbound traffic to one lane for approximately 1 mile.

3.8.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

Under Alternative A, no maintenance and rehabilitation of the spillway and dam structures would occur; therefore, no traffic restrictions would be put into place. Transportation of all vehicles would continue under current conditions. No construction vehicles, equipment, or workers would be at the project sites and no construction activities would occur. Consequently, there would be no effects to transportation.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

The proposed traffic plan for this project was adopted from ITD's Traffic Control Plan for Bridge Closure on SH-39. Routine maintenance and inspections by both Reclamation and ITD occur annually resulting in temporary road closures and/or traffic restrictions on SH-39 on or near the dam.

Based on the Value Engineering Study completed by Reclamation in 2016, a Traffic Control Plan that includes control restrictions on SH-39 and access routes/haul routes/staging areas would eliminate the need to build an access road through the discharge channel downstream of the stilling basin. This would also allow the contract awardee to use two cranes, as needed, staged on westbound SH-39. This was determined to be the safest, most efficient, and cost-effective option to both the government and responsible stakeholders, and would be a necessary component of the proposed project. In consideration of this recommendation, in 2018 Reclamation met with ITD, Power County Transportation Coalition, and Bingham County Transportation Coalition to identify the proposed project and solicit input for the development of an appropriate Traffic Control Plan that would minimize the potential effects of the proposed project.

The resulting proposed Traffic Control Plan was developed in cooperation with ITD and is incorporated in the construction specification. This Traffic Control Plan follows applicable guidance set forth by both the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD) and current ITD traffic manuals. Previous projects completed by ITD at or near American Falls Dam have used similar traffic control plans. The section of SH-39 where it crosses the dam, as well as proposed access routes, haul routes and staging areas where transportation could be affected by the proposed project are identified on a map in Appendix E.

Direct and Indirect Effects

During the construction activities for implementation of the proposed action, traffic on SH-39, adjacent roadways, and within the City of American Falls on and near the identified haul routes would be affected. The proposed project would result in a general increase in traffic locally due to construction traffic related to the proposed action, including construction vehicles, heavy equipment, and employees traveling to and from the construction site daily. The Traffic Control Plan that would be in effect during this project would affect transportation in the local area by limiting access for oversized vehicles and implements, decreasing traffic speeds, and increasing travel times along access and hauling routes and on SH-39 at and near the point where it passes the proposed construction site.

Due to the project's relatively short overall duration and the mitigation efforts that have been developed in working with ITD, Power County Highway District and Power County Transportation Coalition, no significant effects to local commuters, recreators, agricultural entities, or business entities are expected to occur as a result of the proposed action. Specific direct and indirect effects would include the following:

SH-39

The proposed action would require temporary closure of SH-39 westbound lanes from July through November of both 2020 and 2021. At these times all traffic would be rerouted to the eastbound lanes of SH-39 with both westbound and eastbound travel restricted to one lane each for approximately 2 miles. This traffic configuration would allow the contract awardee(s) to stage and access the dam spillway from the upper roadway (westbound lanes) of SH-39 while still facilitating two-way travel in the eastbound lanes of SH-39. It is estimated that these lane closures and traffic restrictions would be in place for a cumulative period of 113 to 130 days over the 2 year construction period.

American Falls Designated Truck Route

Construction disposal materials (concrete) from the project would be transported from the construction site through the City of American Falls on the city's designated truck route, located on Falls Avenue to McKinley Street. This would result in increased traffic, specifically heavy gross vehicle weight (GVW) traffic on this roadway and other identified haul routes during the construction periods. The designated truck route does not have any weight restrictions and is considered the main thoroughfare for GVW over 26,000 lbs. All

other roadways within the City of American Falls have a 26,000 GVW limit. It is anticipated the contractor would only use the designated truck route for transportation to and from the site of vehicles 26,000 GVW and over. Demolition of existing concrete would occur in both the 2020 and 2021 construction periods, resulting in waste material being transported off site. Concrete delivery trucks would travel to the site delivering concrete throughout the 2020 and 2021 construction period. Additional materials would be transported to site on the designated truck route or from I-86 to SH-39.

Restrictions to Oversized Equipment/Vehicle Movement

Oversized vehicles (for example, agricultural tractors, implements, harvesters and other agricultural vehicles) would be permitted to move through the traffic restriction area on SH-39 only twice daily, from 9 to 10 a.m. and again from 5 to 6 p.m. During those timeframes, all traffic would be restricted to only westbound or eastbound directional flow in alternating intervals. Additional general traffic delays to all travelers would be expected during periods designated for oversized vehicle movement.

Emergency Response (police, fire, Emergency Medical Services)

Local emergency response agencies including police, fire and emergency medical services could be affected by SH-39 road closures and traffic restrictions, especially during the oversized vehicle movement periods since oversized vehicles in transit during those times could temporarily block SH-39 eastbound (bridge) and potentially delay emergency response times. Any potential emergency response delays would be expected to be fully mitigated through advanced coordination between emergency medical services and the traffic control company used by the contract awardee.

3.8.3 Cumulative Effects

The work included in the proposed action is scheduled to occur June to November in 2020 and late July to November 2021. Traffic would not be affected outside of these construction periods. During the construction periods, traffic would be affected during daily travel on SH-39 and the proposed transportation routes, and traffic delays would be expected. Communication with highway users would occur throughout the construction periods via press releases and staged reader boards throughout the American Falls area advising commuters of the traffic restrictions scheduled or in place. Also, future scheduled projects at American Falls Dam could require other traffic restrictions. Cumulatively, the effects of the proposed traffic restrictions and volumes would have some effect during the construction period. However, because the overall effect is minimal due to the planning and mitigation measures incorporated into the proposed action, these effects would be considered insignificant.

3.8.4 Mitigation

A Traffic Control Plan developed in cooperation with ITD and local transportation coalitions is included in Appendix A. Coordination with ITD, Power County Highway District, the City of American Falls, Power County Transportation Coalition, and Bingham County Transportation Coalition would be ongoing throughout the project.

The timing of oversized vehicle movements would be targeted to avoid affecting timeframes during which a large volume of traffic from local entities (e.g., rush hour due to shift changes) would be expected, and to allow oversized equipment to be moved during daylight hours. Contract awardee(s) would be required to be flexible in accommodating the movement needs of various oversized vehicles during the harvest season.

Electronic reader boards informing drivers of upcoming restrictions would be placed at multiple locations beginning a minimum of 21 days prior to the road restrictions being imposed. Portable Dynamic Message Boards in place during construction would give drivers advanced and ongoing notice of the hours and dates of additional restrictions for designated oversized vehicle movement periods. Barricades, flaggers, and other necessary precautions for safety of the public would be provided where haul routes cross public highways or roads.

3.9 Indian Trust Assets

3.9.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian Tribes and individuals. The Secretary of the Interior, acting as trustee, holds many assets in trust for Indian Tribes and individuals. Examples of trust assets are lands, minerals, grazing, hunting, fishing, and water rights. While most ITAs are on-reservation, they may also be found off-reservation on federally managed unoccupied lands. The United States has a responsibility to protect and maintain rights reserved by or granted to Indian Tribes and Indian individuals by treaties, statutes, and executive orders. These are sometimes further interpreted through court decisions and regulations.

The Shoshone-Bannock Tribes, which are federally recognized tribes located at the Fort Hall Indian Reservation in southeastern Idaho, have trust assets both on and off reservation lands. The Fort Bridger Treaty was signed and agreed to by the Bannock and Shoshone headman on July 3, 1868. The treaty states in Article 4 that members of the Shoshone-Bannock Tribes "…shall have the right to hunt on unoccupied Federal lands and to include fishing as a form of hunting."

The tribes included fishing after the case of *State of Idaho v. Tinno*, an off-reservation fishing case in Idaho. The Idaho Supreme court determined that the Shoshone word for "hunt" also included "fish." Under *Tinno*, the court in 1994 reaffirmed in *Shoshone-Bannock Tribes v.*

Fish and Game Commission Idaho the tribal members' rights to take fish off-reservation, pursuant to the Fort Bridger Treaty.

Other federally recognized Tribes are the Shoshone-Paiute of the Duck Valley Reservation, located on the Idaho/Nevada border. The Tribe has cultural and religious interests in the area of the project, but the size and duration of this action would not disturb or impede on these interests.

3.9.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

Under the No Action Alternative, there would be no direct, indirect, or cumulative effects to ITAs. The proposed maintenance would not be performed, and the structure would remain in operation in its current condition, leading to further deterioration over time and greater eventual need for action. No known ITAs would be affected.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

Reclamation does not hold any ITAs and does not know of any ITAs held in this area by any other agencies. Therefore, Alternative B would not affect any known ITAs, such as land, minerals, water rights, monetary holdings, and gathering rights in the direct vicinity. As part of the scoping process, Reclamation solicited comments from Tribes that traditionally and currently use the area. However, no responses were received. While the lack of specific information about the area is not indicative of a lack of importance to Tribes, with no specific Tribal response, Reclamation concludes that there would be no adverse effects to any ITAs in the direct vicinity of the proposed action. Implementation of Alternative B would not affect tribal hunting and fishing rights outside the project area.

3.9.3 Cumulative Effects

The actions included for cumulative effects do not overlap with any known ITAs; therefore, no cumulative effects to ITAs are anticipated.

3.9.4 Mitigation

In the absence of ITAs, no mitigation would be necessary.

3.10 Indian Sacred Sites

This section discusses the potential impact to Indian Sacred Sites. Letters were sent to the Shoshone-Bannock Tribes to determine if areas important to the tribes were located within the Area of Potential Effects (APE). Copies of all letters are included in Appendix F.

3.10.1 Affected Environment

It is known that the area has been occupied since Paleoindian times with the most recent occupants identified as the Shoshone, who are thought to have moved into the area after about 1000 AD. No Indian Sacred Sites have been identified to Reclamation within the vicinity of the project area.

3.10.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

As Indian Sacred Sites have not been identified within the project area, there would be no direct nor indirect impacts on historic properties resulting from Alternative A.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

As Indian Sacred Sites have not been identified within the project area, there would be no direct nor indirect impacts on historic properties resulting from Alternative B.

3.10.3 Cumulative Effects

There would be no cumulative effects to Indian Sacred Sites as a result of this project.

3.10.4 Mitigation

In the absence of Indian Sacred Sites, no mitigation would be necessary.

3.11 Cultural Resources

3.11.1 Affected Environment

Evidence of American Indian occupation in southeastern Idaho dates as early as 14,500 years ago. Archaeologists have defined three prehistoric cultural periods in southeast Idaho—the

Paleo-Indian Period (12,500 to 5,000 BC), the Archaic Period (5,000 BC to 1,700 AD), and the Protohistoric Period (1,700 AD to European contact).

Explorers and fur trappers first entered the study area in the early nineteenth century. Settlement in southeastern Idaho began in 1860. During the 1870s, gold discoveries brought miners to southeast Idaho. The first permanent habitation at American Falls occurred starting in the early 1880s, during which a ferry crossing and a post office were established. A railroad crossing for the Oregon Short Line Railroad crossed the Snake River at this point from 1882 to1883. The City of American Falls was platted in 1886. The biggest influx of population occurred in response to irrigated agriculture developments.

According to Buckendorf 1993, the City of American Falls was a trading center for cattle and sheep ranchers with small irrigated plots. The development of dry farming in surrounding areas brought additional people to the area. Wheat became a major crop and the railroad running through town allowed for the transportation of crops to market. The first American Falls Dam was completed in 1905. It was replaced by a much larger structure in 1927 and again by the current dam in 1978.

3.11.2 Environmental Consequences

Methods and Criteria

In February 2017, Reclamation reviewed a record search it has on file that was completed at the Idaho State Historical Society and includes the current APE. Additionally, Reclamation reviewed historic maps and aerial photographs. A pedestrian archaeological survey of approximately 3.5 acres was completed in March 2017, which included two small staging areas identified for the project. The spillway was not surveyed as it is a built feature dating to the 1970s. Fifteen meter transects were used to cover each of the staging areas. Lastly, the Shoshone-Bannock Tribes were consulted for information about potential cultural resources within the proposed work area. Consultation was completed with the Idaho State Historic Preservation Officer and American Indian Tribes in April 2017 (Appendix F).

A total of 17 previously recorded cultural resources were identified within 1 mile of the APE. These include three lithic scatters, three powerplants, two historic buildings, two trails, two isolated finds, a flooded townsite, a canal, a memorial park, a ferry site, and a railroad. Two of these—the American Falls Flooded Townsite and Oneida Milling and Elevator Company Grain Elevator—are listed in the National Register of Historic Places. None are located within the APE. The survey did not identify any new cultural resources. Both staging areas have already undergone heavy disturbance from construction of the dam and railroad grade.

Alternative A – No Action

Direct and Indirect Effects

As no cultural resources are located within the project area, there would be no direct nor indirect impacts on historic properties resulting from Alternative A.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

No historic properties have been identified within the APE. In the absence of identified cultural resources, Reclamation has determined that no cultural resources would be affected by this project. There would no direct nor indirect impacts on cultural resources resulting from Alternative B.

3.11.3 Cumulative Effects

There would be no cumulative effects to cultural resources as a result of this project.

3.11.4 Mitigation

In the absence of historic properties, no mitigation would be necessary.

3.12 Socioeconomics

The socioeconomic character of an area includes its population and economic activity. Socioeconomic changes may occur when a project directly or indirectly changes any of these elements. This section discusses socioeconomic resources within the human environment, particularly population and economic activity that could be affected by the proposed alternative. Population is described in terms of the size, rate of growth, and distribution of people who live and work in the area. Economic activity is described in terms of employment distribution, personal income, and business growth.

3.12.1 Affected Environment

Population

The population of Power County, Idaho, is estimated at 7,600 according to U.S. Census Bureau (Census Bureau) 2017 estimates (Census Bureau 2017a). This is an approximately 2.8 percent decrease from 2010, when the population was 7,817 residents. In comparison, the nationwide population growth rate has averaged just over 0.7 percent per year in the last decade (Census Bureau 2017b). In terms of population, Power County ranks 33rd largest of

the 44 counties in Idaho. The City of American Falls is the county seat and largest city in Power County with a reported population of 4,457 (Census Bureau 2017b).

Economic Activity

The Idaho Department of Labor (IDL) reported a 2.6 percent unemployment rate in Power County in 2018, compared to 2.7 percent unemployment statewide and 2.5 percent unemployment on the combined southeastern region of the state in 2018 (IDL 2018). Unemployment has generally remained consistent in Power County since 2012. Employment in Power County is largely dependent on agriculture and related manufacturing. American Falls Reservoir is considered to be one of the best boating and fishing lakes in the state, offering marinas, beaches, and excellent trout fishing opportunities with the potential to draw tourists to American Falls.

Per capita income for the State of Idaho is lower than the national average, and income in Power County has consistently remained lower than statewide averages. In 2017, the average per capita income in Power County was $36,969, while the average per capita income was $41,828 statewide and $51,640 nationwide. Per capita incomes in Power County averaged 92 percent of those in Idaho over the last 10 years and were, on average, 73 percent of the per capita income nationwide over the same 10 year time span (IDL 2018).

3.12.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

Under the No Action Alternative, the proposed alternative would not take place. The existing conditions of the concrete on the spillway and dam structures would continue to worsen over time. However, the socioeconomic climate would not be affected by this lack of action.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

Under the Proposed Action Alternative, the need for general and specialized labor for the construction work to be performed could bring minor, short-term (up to the 2 year duration of the project) economic gains to the local area through the contracting process. However, due to the project's relatively short overall duration, no significant effects to local demographics or employment and income trends would be expected to occur as a result of the proposed action.

3.12.3 Cumulative Effects

Other dam and hydroelectric related maintenance, upgrade, and refurbishment work planned to occur at American Falls Dam and powerplant within the next 7 years may also have a socioeconomic effect. These activities can be expected to have a minor ongoing positive effect to the local economy and labor force through the contracting process for construction and other general and specialized labor. Cumulatively, the effects of these individual future projects may contribute to slight, but insignificant, economic gains to the local area.

3.12.4 Mitigation

As no significant effects to local demographics or employment and income trends would be expected to occur as a result of the proposed action, no mitigation would be necessary.

3.13 Environmental Justice

EO 12898 (59 FR 7629) requires Federal agencies to achieve environmental justice by addressing disproportionately high and adverse human health and environmental effects on minority and low-income populations. To determine the characteristics of the affected populations, the Federal agency examines the demographics of the affected area to determine if minority (including Native Americans) and/or low-income populations are present. If present, the agency must determine if implementation of the Proposed Action would cause disproportionately high and adverse human health or environmental effects on the populations.

3.13.1 Affected Environment

The racial demographics of Power County, Idaho and the State of Idaho are compared in Table 1. Population estimates provided by the Census Bureau were used to identify these populations. White racial categories comprise the highest percentage of the population in Power County, as well as the rest of the State of Idaho (Census Bureau 2017a). By the Federal Office of Management and Budget's definition, race and Hispanic or Latino origin are two separate categories. People who report themselves as Hispanic and Latino can be of any race. Therefore, in Table 1, the number of Hispanics or Latinos is not added to the totals of the race columns. For example, Hispanics and Latinos who are white are counted in the total of white in the race table, and Hispanics who are black or African American are counted in that race category.

Table 5. Summary of racial populations in Power County, Idaho, and the State of Idaho.

U.S. Census Bureau 2017 Statistics	Power County	Idaho
2017 Total Population Estimate	7,600	1,716,943
White, percent	92.3	93.3
Black or African American, percent	1.1	0.8
American Indian and Alaska Native, percent	3.7	1.8
Asian, percent	0.5	1.5
Native Hawaiian or Pacific Islander, percent	0.2	0.2
Two or more races, percent	2.2	2.4
Hispanic or Latino, percent	34.5	12.3
White alone, not Hispanic or Latino, percent	60.7	82.4

Hispanic or Latino populations represent a substantial percentage of the population in Power County (approximately one third) in comparison to the lower overall percentage (approximately one tenth) statewide. This is not particularly unique to Power County, but is reflective of the broader statewide demographic trend of people of Hispanic or Latino origin making up a higher percentage of the population in rural areas with agricultural based economies than they do in more urbanized locales (for example, only 8.2 percent of the population in highly urban Ada County identify as Hispanic or Latino).

Low income populations are identified by several socioeconomic characteristics. Specific characteristics used in this description of the existing environment, as categorized by the U.S. Census Bureau, are income (per capita income and median household income) and percentage of the population below poverty. Table 6 shows the most recent 5 years' income and poverty rate data for Power County and the State of Idaho (Census Bureau 2017a, IDL 2018).

Table 6. Income and poverty data for Power County and the State of Idaho, 2013 to 2017.

Geographic Area	Per Capita Income in Past 12 Months (2017 dollars)	Median Household Income 2013-2017 (2017 dollars)	Persons at or Below Poverty Level (percent)
Power County	$21,513	$47,602	14.6%
State of Idaho	$25,471	$50,985	12.8%

3.13.2 Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

The No Action Alternative would not alter the current regional environmental justice status based on the presented information above, and therefore would have no environmental justice effects.

Alternative B – Maintenance and Rehabilitation of Spillway and Dam Structures (Proposed Action)

Direct and Indirect Effects

Due to the fact that the proposed action is a short-term, localized action that has the potential to equally affect all residents of the City of American Falls and the immediately surrounding area (as well as tourist and recreational visitors from other areas across the state), it is reasonable to expect that there would be no focused significant effect from the proposed action to any one particular minority group, including Hispanic and Latino populations.

The Proposed Action Alternative has been reviewed through census data and application of the EPA's EJSCREEN tool[3]. No minority or low-income groups, as identified for further analysis by Executive Order 12898, were identified that would be disproportionately affected by health or environmental effects as the results of the implementation of the Proposed Action Alternative. Due to the fact that the proposed action is a short-term, localized action that has the potential to equally affect all residents of the City of American Falls and the immediately surrounding area (as well as tourists and recreational visitors from other areas across the state), it is reasonable to expect that there would be no focused significant effect from the proposed action to the greater area's low income populations.

3.13.3 Cumulative Effects

Other dam and hydroelectric related maintenance, upgrade, and refurbishment work planned to occur at American Falls Dam and powerplant within the next 7 years may also be expected to have a minor ongoing positive effect to the local economy and labor force through the contracting process for construction and other general and specialized labor. Cumulatively, the effects of these individual future projects may contribute to slight, but insignificant, economic gains to the local area.

3.13.4 Mitigation

Since the proposed action would not have a disproportionate affect to the greater area's low income populations or to any one particular minority group, including Hispanic and Latino populations, no mitigation would be necessary.

[3] The EPA's EJSCREEN tool is available online at https://ejscreen.epa.gov/mapper/ (last accessed May 7, 2019)

Chapter 4 Consultation and Coordination

On November 21, 2018, Reclamation mailed a scoping document including a letter, preliminary project information, and a map to agencies, organizations, and individuals to solicit their help in identifying any issues and concerns related to the proposed action. A press release was also issued to local outlets on that date, and information was made available online at the Reclamation website. Reclamation received no comments. The complete mailing list of scoping and Draft EA recipients, scoping letters and informational document, and comments received are presented in Appendix H.

4.1 Agency Consultation and Coordination

Reclamation conducted multiple interagency meetings and teleconferences for information sharing and coordination purposes throughout 2018 and up until the finalization of a Draft EA in March of 2019. Agencies represented at these meetings included Reclamation, IDEQ, IDFG, and Idaho Power. A Draft EA and the Draft Water Quality Restoration Plan were provided to IDFG and IDEQ for comment on April 5. Reclamation received a response letter from IDFG on April 12, 2019, stating that there were no suggested revisions prior to finalization of the EA (Appendix I). Communication with IDEQ toward finalization of the Draft Water Quality Restoration Plan (Appendix D) is ongoing as of the finalization of this EA.

4.1.1 National Historic Preservation Act (NHPA)

Reclamation initiated and completed consultation with the Idaho State Historic Preservation Office in April 2017. The State Historic Preservation Office concurred with Reclamation's finding of no impact on Historic Properties for the project area (Appendix F).

4.1.2 Endangered Species Act (ESA)

Reclamation generated a preliminary Endangered Species report through the USFWS IPaC site (Appendix G). The report indicated no listed species are expected to be present in the action area for this proposed project, and no proposed or designated critical habitats associated with any listed species overlap with the project's area of influence. Since the proposed action would not reasonably be expected to adversely affect any listed species, no need exists for formal Section 7 consultation under the ESA.

4.1.3 Clean Water Act (CWA)

The proposed project would require a Section 404 permit from the U.S. Army Corps of Engineers. In addition, the state would then provide a CWA Section 401 water quality certification for the construction activity. These permits and certifications would outline

requirements to minimize the effects to water quality associated with the construction activities. Reclamation is currently in the process of initiating these applications.

4.1.4 Interagency Informational Meetings

Reclamation held the following meetings with stakeholder state agencies and Idaho Power officials during the planning process for this EA (Table 7):

Table 7. Agency and stakeholder meetings conducted during EA planning and preparation.

Date	Involved Parties	Issues discussed
4/30/2018	Reclamation, Idaho Power	Overall project overview, cooperative operations, and initial water quality concerns
8/13/2018	Reclamation, Idaho Power	DO, additional water quality concerns, and operational mitigation strategies
11/7/2018	Reclamation, IDEQ	Water quality concerns, monitoring, and mitigation strategies
11/16/2018	Reclamation, Idaho Power	Operational considerations, water quality concerns, and mitigation strategies
11/19/2018	Reclamation, IDEQ, IDFG	Water quality concerns, compliance strategies, water system management, and fisheries concerns

4.2 Tribal Consultation and Coordination

Reclamation mailed scoping letters to the Shoshone-Bannock and Shoshone-Paiute Tribes on November 16, 2018 (mailing list and FedEx receipts are included in Appendix H). No responses or concerns from the Tribes were brought forward during the scoping period. The complete mailing list of tribal recipients, scoping letter, and informational document included with the scoping mailing are included in Appendix H.

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Chapter 5 References

Parenthetical Reference	Bibliographic Citation
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Appendices

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APPENDIX A

Traffic Control Plan

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Traffic Control Plan

TRAFFIC CONTROL – American Falls Spillway Concrete Repair

PART 1 GENERAL

GENERAL

1. This work consists of designing and implementing all Temporary Traffic Control Plans and Operations, and installing, maintaining and remove and resetting Temporary Traffic Control Zone Devices (as detailed in the Temporary Traffic Control Plans) for the project limits, in accordance with Section 626 of the 2018 Idaho Transportation Department (ITD) Standard Specifications for Highway Construction and the Manual on Uniform Traffic Control Devices (MITCD) as adopted by the State. This will include the Temporary Traffic Control Plans and all labor and material required (not already covered under another item) to perform in accordance with the documents and in accordance with all relevant statues, regulations, and/or guidelines. Traffic is defined as: pedestrians, bicyclists, motorized vehicles and other forms of surface transportation.

REFERENCE STANDARDS

A. Federal Highway Administration, Department of Transportation

1. MUTCD, Part 6 Part 6, Temporary Traffic Control, MUTCD 2000, Manual on Uniform Traffic Control Devices, 2003 Edition, with Revision No. 1, July 21, 2004 (http://mutcd.fhwa.dot.gov/)

B. Idaho Transportation Department

1. Section 626 2018 Idaho Transportation Department (ITD) Standard Specifications for Highway Construction

PART 2 PRODUCTS

MATERIALS

A. All Temporary Traffic Control Zone Devices used will meet the requirements of both the MUTCD, as adopted by the State and subsection 626.02 of the 2018 Idaho Transportation Department (ITD) Standard Specifications for Highway Construction.

TRAFFIC CONTROL

A. Perform the Design of all Temporary Traffic Control Plans for Contractor Operations, Installation, Maintenance and Removal of all Temporary Traffic Control Zone Devices. The Contractor will perform the engineering services required to complete Temporary Traffic Control Plans for all work operations.

B. The Contractor will furnish, install, maintain, and remove and reset any Temporary Traffic Control Devices used for the purpose of regulating, warning, or directing traffic at all work locations. Temporary Traffic Control Plans will meet or exceed the requirements of the current MUTCD (as adopted by the State), the current ITD Traffic Manual, the

current AASHTO Roadside Design Guide, the current ITD Work Zone Safety and Mobility Policy, and the current Public Rights-of-Way Accessibility Guidelines (PROWAG).

C. The Temporary Traffic Control Plans will include proposed traffic routing; lane restrictions; location, size, and message of signs; sign number designations in reference to the ITD Sign Chart and the MUTCD (as adopted by the State); special signs and details; location, length, and spacing of channelization and protective devices. The Temporary Traffic Control Plans will be signed and sealed by an engineer currently licensed in the State of Idaho.

D. The sealed Temporary Traffic Control Plans will be submitted to the Engineer electronically a minimum of 60 days prior to initial implementation. Also submit to the Engineer a narrative describing the traffic control equipment, operations, and sequence of work. The Contractor will obtain Engineer approval of the Temporary Traffic Control Plans prior to implementing the Temporary Traffic Control Plan.

E. All Temporary Traffic Control Zone Devices used will meet the requirements of both the MUTCD, as adopted by the State and subsections 626.02 and 626.03.

F. Mobile Operations will at a minimum meet the requirements of the MUTCD, as adopted by the State.

G. Project-Specific Traffic Control Requirements:

1. Traffic Control shall be required across the lower Bridge at the American Falls Dam. The Length of The Traffic control work zone is anticipated to be a minimum of two miles due to separated roadways at the site of the American Falls Dam. Two-way two-lane operation shall be used on the lower roadway except during permitted Oversized Vehicle Movement times. Portable Tubular Markers shall be double based, and have a minimum combined weight of 25 pounds. Class B Drums shall be used at any and all Merge and Shift Tapers. Contractor shall provide a minimum of 4-MUTCD compliant Portable Dynamic Message Boards for the duration of the project and for advance warning of the project.

2. Contractor shall setup Oversize Vehicle Staging Areas (including but not limited to agricultural tractors, implements, harvesters and other implement of husbandry) and work with ITD and the Power County Highway District to accommodate oversize vehicles through the project work zone. This will include removing and resetting temporary Traffic Control Devices for each authorized daily movement time(s). Contractor shall provide Flaggers and Flagger Signing for Oversize Vehicle Movements.

3. Signs installed longer than 3 days shall be on wood posts, unless otherwise authorized by Idaho Transportation Department District 5 Traffic Engineer.

4. Contractor shall place Portable Dynamic Message Boards in the following four locations beginning 30 days before traffic restrictions are in place.

a. SH39 east bound near entrance to U.S. Bureau of Reclamation
b. Lamb Weston Road near SH39 intersection
c. S. Frontage Road near American Falls High School
d. SH west bound near Idaho St. intersection

H. Contractor shall allow movement of Oversize Vehicles twice daily, or as otherwise approved authorized by Idaho Transportation Department District 5. Movements shall occur one each per day from 9:00 am to 10:00 am and from 5:00 p.m. to 6:00 p.m. or as otherwise authorized by the Bureau of Reclamation in working with Idaho Transportation Department District 5. Portable Dynamic Message Boards (identified in locations above) shall advertise these hours and dates during Construction. Contractor shall be flexible for the days of the week during the Harvest Season to meet varied Oversize Vehicles movement needs.

I. Public Outreach shall be made through letters, newspaper articles and social media with the large farms in the area and Stakeholders that are identified.

J. Inspection and maintenance shall occur at least 2 times per day, in the early morning and the evening, and when Temporary Traffic Control Devices are not operational from knockdowns, damage, or any other event that causes it to be non-operational. Nonoperation shall be defined per the Temporary Traffic Control Plan.

K. Meet requirements of MUTCD, Part 6.

L. Provide cones, delineators, concrete safety barriers, barricades, flasher lights, danger signals, signs, and other temporary traffic control devices as required to protect work and public safety.

M. Provide flaggers and guards as required to prevent accidents and damage or injury to passing traffic.

N. Traffic control plan needs to include provisions to facilitate oversized loads through the construction area.

O. Do not begin work along public or private roads until proper traffic control devices for warning, channeling, and protecting motorists are in place in accordance with approved traffic control plan.

P. Maintain traffic flow and conduct construction operations to minimize obstruction and inconvenience to public traffic.

Q. Provide unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations.

R. Construct temporary connections for one lane of traffic between existing roadway and new construction.

S. Maintain convenient access to driveways, houses, and buildings along line of work.

T. Protect roads closed to traffic with effective barricades and warning signs. Illuminate barricades and obstructions from sunset to sunrise.

U. Remove traffic control devices when no longer needed.

APPENDIX B

Water Quality Management Action Plan (2010)

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AMERICAN FALLS RESERVOIR ACTION PLAN, BUREAU OF RECLAMATION, PACIFIC NORTHWEST REGION

Version. September 2010

1.0 UPPER SNAKE BASIN SYSTEM

1.1 General

The upper Snake River basin system, above Milner Dam, comprises the following Reclamation projects:

- Minidoka Project
- Palisades Project
- Michaud Flats Project
- Ririe Project (constructed by USACE, operated by Reclamation)

Most of Reclamation's storage above Milner Dam provides a supplemental water supply for irrigation. Space-holder contracts require an underlying State water right, and natural flows be fully utilized before storage is made available. As a result, surface water users rely upon a combination of natural flows and storage. Natural flow includes reach gains within and upstream of the gaining reach unless depleted by senior rights. Providing a sufficient amount of water in the river for out-of-stream diversion, while maintaining viable flows, requires a high degree of coordination among irrigators, storage operators, and the State watermaster. Mostly, this is accomplished by storing water as physically high (upstream) in the reservoir system as possible, then moving water downstream only when required. In general, demands are met from the nearest storage reservoir upstream from the point of diversion, then from reservoirs progressively upstream as the stored water supply diminishes.

1.2 American Falls and Minidoka

American Falls Dam is located at river mile 714.1 on the Snake River. It was completed in 1927 and rebuilt in 1977. The dam is now a 94-foot-high composite concrete-and-earth structure with a crest length of 5,277 feet at elevation 4366.5 feet. American Falls Reservoir is operated and maintained by Reclamation for irrigation water supply and informal flood control. IPC owns and operates a powerplant at the dam under a FERC license. Total active capacity at American Falls Reservoir is 1.673 KAF, with no inactive or designated dead space.

Construction of Minidoka Dam began in 1904 and was completed in 1906; Minidoka Powerplant was completed in 1909. In 1909, the overflow spillway section was raised 5 feet with the addition of concrete piers to support 334 bays of stop-logs.

Through most of the irrigation season, the water surface at Lake Walcott is maintained at or near maximum elevation to ensure water deliveries to the irrigation districts and to provide maximum hydraulic head for hydropower generation at the Minidoka Powerplant. In the late irrigation season, drawdown of Lake Walcott in preparation for winter can meet some downstream irrigation demands. Currently, Lake Walcott is drafted approximately 5 feet below full pool during the winter to keep ice buildup from interfering with and further damaging the existing spillway. Once the ice cover melts, or the threat of substantial freezing has passed, the reservoir is brought up to full pool elevation. Depending on demand and weather, this usually begins mid-March and is completed by the end of April. Reservoir draft and refill rates are dependent upon water year type, irrigation demands, and water availability.

The minimum flow expected below the project at the U.S. Geological Survey (USGS) gage (USGS 13081500 Snake River near Minidoka Idaho, at Howells Ferry) during the period between 2000 and 2008, is 500 cfs, typically occurring during the winter months. The gaged flow is comprised of power plant discharges, spillway flow, and seepage.

2 AMERICAN FALLS RESERVOIR AND LAKE WALCOTT

2.1 Operations

2.1.1 General

American Falls operations have not changed substantially since the construction of Palisades Dam in the 1950s. On average, American Falls Reservoir will fill by the end of May. Flood control operations at American Falls Reservoir are informal, and do not require a space reservation except in very wet snowmelt seasons. Reclamation directs Idaho Power Company powerplant releases for flood control operations and irrigation needs. Reclamation also attempts to provide a minimum flow of 350 cfs below the project during the winter months. Idaho Power Company will release water to comply with minimum flow requirements at Milner or for power production needs up to their contract storage amount of 44 KAF.

During the early 1990's, storage was severely depleted due to drought. In 1990, the reservoir storage reached 0 KAF. In 1994, when the storage reached 17.5 KAF, Reclamation self reported to Idaho Department of Environmental Quality (IDEQ). Reclamation's awareness of sediment volume issues precipitated the discussions that lead to the notification request in the Lake Walcott total maximum daily load (TMDL).

Throughout much of the 2000's, southern Idaho was again experiencing drought conditions ranging from moderate to severe drought. As a result, American Falls Reservoir contents often fell below 50 KAF.

In order to comply with the TMDL and the Terms and Conditions set forth in the USFWS Biological Opinion, Reclamation will minimize the frequency, extent and duration of American Falls Reservoir drawdown below 50,000 acre-feet. Therefore, in drier years when system storage above the project is nearing depletion, Lake Walcott drafting may begin as early as mid-August, in order to retain a minimum volume target of 100,000 acre-feet in American Falls Reservoir in an attempt to meet water quality compliance standards and ESA requirements below American Falls Dam.

Figure 1. American Falls Reservoir Annual Minimum Content

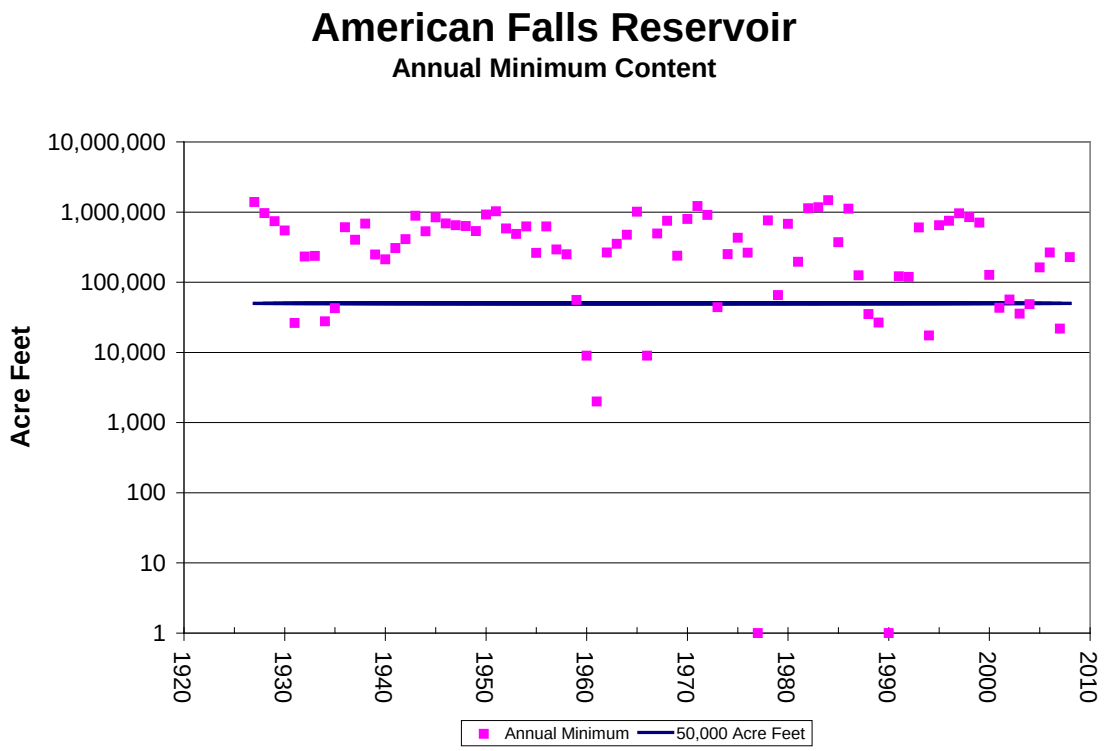

Figure 1. American Falls Reservoir Annual Minimum Content

2.1.2 Minidoka Dam Spillway Replacement

The purpose of the proposed spillway replacement action is to prevent structural failure of the Minidoka Dam spillway and associated structures. After 103 years of continued use, the 2,000-foot-long concrete spillway has reached the end of its functional lifespan.

It is anticipated that after spillway reconstruction, the reservoir will no longer be constrained to the winter draft of 5 feet to protect the spillway. Therefore, drafting of Lake Walcott would typically occur only during drier years, when the minimum volume

target of 100,000 acre-feet in American Falls Reservoir is approached in an attempt to meet water quality compliance standards and to comply with ESA requirements below American Falls Dam. Lake Walcott would be drafted below full pool in late summer/fall only to satisfy water right demands and maintain as much of the target volume in American Falls Reservoir as possible for compliance. As a result, Lake Walcott would remain at low pool during the winter months and refill during March.

2.1.3 Flow Augmentation

Reclamation's actions in the upper Snake include the provision of flow augmentation to benefit migrating salmon and steelhead. Reclamation has provided flow augmentation to benefit fish since 1991. Longstanding disputes over water allocation were addressed by the 2004 Nez Perce Water Rights Settlement (Settlement) and the Snake River Water Rights Act of 2004 (P.L. 108-447), which includes provisions to allow Reclamation's continued delivery of flow augmentation water for a 30-year period.

Under the Settlement, Idaho Code § 42-1763B was reenacted to authorize the rental and protection to the state line of up to 427,000 acre-feet of water annually for flow augmentation from traditional sources for the 30-year term of the agreement. It also provided that Reclamation could rent or acquire for protection to the state line 60,000 acre-feet of water from natural water right holders along the Snake River. Also authorized was the release and protection of water stored in reservoir powerhead space to firm up the ability to provide 427,000 acre-feet. These provisions improve Reclamation's ability to obtain water for flow augmentation by increasing the reliability of obtaining 427,000 acre-feet, and allowing as much as 487,000 acre-feet in years of adequate water supplies. Augmentation is now consistent with State law.

2.2 Water Quality and Monitoring

Reclamation's monitoring programs serve several purposes for both IDEQ and Reclamation. By providing laboratory support as well as collecting reservoir and river data, Reclamation and IDEQ are able to track current conditions in the river and reservoir system. Additionally, IDEQ is better able to determine TMDL implementation progress and in some cases best management practice (BMP) effectiveness. This information provides the foundation of an informative feedback loop for both TMDLs in the American Falls and Lake Walcott Subbasins as well as for operational decisions made by Reclamation.

2.2.1 Water Quality

Reclamation staff monitors water quality in American Falls Reservoir. American Falls Reservoir is part of a long term monitoring program has been in place for over thirty years. In order to adequately cover a majority of Reclamation reservoirs throughout the Pacific Northwest, the regional reservoir program limits monitoring for a specific reservoir to once every three years. However, when the water level in American Falls

Reservoir drops below 100,000 acre feet, Reclamation collects water quality samples above and below American Falls Reservoir on a weekly basis. The samples are collected above the reservoir at Tilden Bridge and immediately below the dam. The samples are analyzed at Reclamation's water quality laboratory for total suspended solids, suspended sediment concentration, volatile solids, and turbidity. The sampling and analysis costs are approximately $2,000 per year under these conditions.

Reclamation collects a surface and bottom water samples near the dam and water samples below the dam as part of the regional reservoir monitoring plan. The samples are collected every three years and are analyzed for trace metals, mercury, arsenic, specific conductance, sulfate, total Kjeldahl nitrogen, turbidity, alkalinity, ammonia, biological oxygen demand, chemical oxygen demand, chloride, residual chloride, dissolved oxygen, fluoride, nitrate, nitrite, total organic carbon, pH, ortho-phosphate, total phosphorus, hardness, chlorophyll a, silica, bacteria, and boron. The sampling and analyses costs average $3,000 for each sampled year. These data are available on STORET or by request.

2.2.2 Quagga Mussels

American Falls Reservoir is considered a high priority reservoir for Quagga mussel surveillance. As a result, the Quagga mussel program designed to supplement the regional reservoir monitoring program, requires annual monitoring of American Falls Reservoir.

2.2.3 Sediment

In order to reduce sediment loading in American Falls Reservoir, Reclamation has conducted major shoreline protection programs at the reservoir and has participated in several other smaller projects along the Snake River. These efforts were designed to protect the shoreline from erosion caused by wind induced waves in an attempt to reduce the sediment loading in the reservoir and subsequently downstream when the volume in American Falls reservoir approached 50KAF. Another benefit of the stabilization projects include reduced siltation into the reservoir which in turn preserves storage space. The smaller stabilization projects were located above the reservoir on the Snake River.

The American Falls Reservoir shoreline protection program began in 1980 to address the bank erosion and the subsequent potential loss of farmland. This program had two elements, acquisition and stabilization. Reclamation purchased land around the reservoir to ensure that no further loss of private property would occur. Stabilization efforts included placing rip rap on the shoreline to approximately eight feet below full pool. The stabilization project was also designed to minimize re-suspension of sediments from seiches and waves. These measures are effective for preventing erosion of the shoreline during higher pool elevations.

Since the program was initiated, the rip rap has been placed on over 110,000 linear feet of bank. The annual budget for the program has been constant since the early 1990's at $590,000. Reclamation is also exploring other potential river bank stabilization techniques, similar to those conducted in the Fort Hall project.

The Fort Hall Landmark bank stabilization project, in conjunction with the Shoshone-Bannock Tribes, was designed to reduce shoreline erosion along the Snake River. This project stabilized approximately 3,800 lineal feet of riverbank, most of which was located on Reservation lands. This project was located approximately two miles upstream from American Falls Reservoir, and mainly consisted of placing a rock barrier on and adjacent to the current river bank. The project costs were approximately $2.75 million dollars, in 2008. Monitoring of the project is being done to determine if further actions are necessary to maintain river bank stability and which configurations provide the most benefit.

The other bank stabilizations and erosion projects in and above the American Falls Reservoir are shown in Table 1.

Table 1. Bank Stabilization Projects on the Snake River Above American Falls Reservoir.

Project	Description
Demonstration Project	Reclamation partnered with NRCS in the Fort Hall area to demonstrate the effectiveness of placing logs along the river bank for natural stabilization.
NRCS Planting Project	Reclamation partnered with NRCS to plant vegetation along the shoreline to reduce erosion.
Boy Scout Project	Reclamation worked with a local Boy Scout troop to place rocks along shoreline to reduce erosion.
Bank Stabilization Study	Reclamation conducted a bank stabilization study for the Shoshone-Bannock Tribes outlining stabilization practices. The report will be used by the tribe to solicit funds from the U.S. Congress to conduct the projects.
McTucker Island	Reclamation assisted in removing wild horses from McTucker Island in the Snake River. The horses were continually migrating from the island to the shore causing bank sloughing and increasing suspended sediment in the Snake River.
Shoreline Fencing	Reclamation worked with the Shoshone-Bannock Tribe to install fencing along the shoreline in order to keep cattle from entering the river and increasing suspended sediment and erosion.

2.2.4 Water Conservation

Reclamation partners with irrigation districts and stakeholders to promote water conservation. The goal of these projects is to accurately measure and reduce the amount of water diverted from the Snake River, thereby leaving more water in the system. The types of conservation projects include canal lining and piping, automation, telemetry, water measurement, and drain reuse. Lining and piping of canals alone can conserve an estimated 20-30 percent of the water diverted from the river. As part of the 2009 Eastern Snake Plane Aquifer Comprehensive Aquifer Management Plan, lining and piping efforts will be made in areas that do not impact incidental recharge to the aquifer.

2.2.5 Laboratory Services

One of Reclamation's Pacific Northwest Region facilities is a water quality laboratory, located in Boise, Idaho. The laboratory's capabilities include in-situ sample collection, field data collection and laboratory analyses. The laboratory provides valuable data and information used in various activities that range from TMDL development to compliance monitoring.

Reclamation's laboratory also provides in-kind services to other entities within the Upper Snake River region. Reclamation's water quality laboratory currently has an agreement with the University of Idaho Extension Services for them to collect samples from the Snake River at three different sites every two weeks. In return, Reclamation analyzes the samples for nutrients, sediment, and turbidity, as in-kind services. The annual cost for processing the water quality samples from the Snake River averages $22,000.

The water quality laboratory has also provided laboratory analysis services to the IDEQ as part of their American Falls Reservoir monitoring project. The samples taken from the reservoir are analyzed for nutrients, sediment, and chlorophyll. The in-kind services for this project average $6,000 annually for the laboratory analyses. In addition, the laboratory is providing IDEQ with laboratory services for monitoring tributaries above Minidoka Dam as part of the Lake Walcott TMDL review. These in-kind services for this project were estimated at $6,000 for fiscal year 2009. It is anticipated that this project will continue for several more years but will depend on future funding levels.

3 COMMUNITY PARTICIPATION

3.1 WAG/TAC Meetings

Reclamation has attended and participated in the Lake Walcott, Mid Snake, and American Falls Watershed Advisory Groups (WAG). In addition, Reclamation has served on various technical advisory committees (TAC) in the Upper Snake River Basin. The WAGs represent the stakeholders from different watersheds throughout the region, including the American Falls section of the Snake River. Reclamation has been

participating in the American Falls WAG since 2003 by providing water quality laboratory services. Reclamation serves in a technical and advisory role to other entities in the nonpoint source community. Reclamation has provided financial assistance to irrigation districts, system operators, and other similar nonpoint source entities for watershed improvements.

As part of the WAG, Reclamation assisted in the American Falls Reservoir TMDL development and implementation. Reclamation provided laboratory services to IDEQ to characterize water quality conditions in and above the reservoir. These data were used to construct a water quality model for TMDL development. These data will subsequently be used for TMDL implementation tracking purposes.

Reclamation has participated in, or plans to participate in the development and implementation of at least 15 other TMDLs within the Snake River Basin. While no explicit nonpoint source load allocations have been assigned to Reclamation in any of the previous upper Snake River TMDLs, Reclamation has consistently provided technical and financial assistance to help ensure that the water quality characterization of the river and reservoirs is accurate. Reclamation will participate in future WAG meetings to work with stakeholders in understanding how climate and operations affect water quality in the reservoir and river system based on available information.

3.2 Operational Planning Meetings

Space holder repayment contracts require an elected advisory board for Reclamation's operation of the Minidoka and Palisades Projects. This advisory board has a similar relationship to Reclamation as a watershed advisory group has to IDEQ. The Committee of Nine (Committee,) the advisory committee for Idaho, Water District 1, is designated as Reclamation's advisory board by the repayment contracts. Some operational actions, particularly those that increase use or timing of storage by moving water downstream, require approval of the advisory committee and/or the State Watermaster. Reclamation is required to meet with the Committee at least 2 times per year. In practice, Reclamation meets with the committee, on average, 6 times per year. The meetings are publicly held and the schedule along with individual meeting agendas, are posted at the Water District 1 Office in Idaho Falls, 48 hours prior to the meeting. A complete schedule for the year can be found at:

http://www.waterdistrict1.com/committee%20of%20nine.pdf.

Since the failure to fill upstream reservoirs in 2007, the Committee has appointed a subcommittee to monitor winter operations. The subcommittee meets when additional information or Reclamation determines a significant change in operations is necessary. Flood control operations can be considered a significant mid-season change as well as low reservoir water levels that warrant a subcommittee meeting. These meetings are posted on the web page and are open to the public. Reclamation will give IDEQ notification of when the committee and subcommittee meetings are held.

4 PROPOSED BEST MANAGEMENT PRACTICES

4.1 General

Reclamation is financially committed to continue implementation of best management practices (BMP's) for water quality improvement or enhancement. Reclamation develops its appropriated budget three years in advance. As part of the budgeting process, funding for BMP programs and participation in the WAG and TAC meetings, as described in Section 3, is included. By including these programs in its annual budgeting cycle, Reclamation is able to ensure it has the financial resources to continue its commitment to support water quality related activities in the Upper Snake River Basin.

4.2 Operations

4.2.1 General

Reclamation uses observed reservoir contents, weather and runoff forecasts, historical records, trends in water use and anecdotal information provided by spaceholders and other state and federal agencies to conserve water and avoid, whenever possible, water quality problems that have been identified in reservoirs and associated river reaches. Reclamation targets a minimum content of 100 KAF in American Falls Reservoir from the beginning of the storage delivery season to avoid increased levels of total suspended solids (TSS) discharged below the dam. Reclamation will attempt to release water from upstream in the system in an attempt to preserve 100 KAF in American Falls Reservoir. However, if hydrologic conditions and irrigation demand on reservoir storage are not capable of retaining this target volume, discharges below American Falls may not be in compliance with TSS targets.

Reclamation will commit to increasing communication with IDEQ concerning antecedent system conditions, operational constraints, and end of irrigation season hold over goals. Reclamation will meet with IDEQ annually as needed to discuss the current water year and forecasted reservoir volumes. This meeting will also serve as the forum to discuss ongoing BMPs and to propose and plan any future reasonable BMPs that Reclamation and IDEQ deem appropriate.

4.2.2 Biological Opinion, Reasonable and Prudent Measures

A reasonable and prudent measure provided in the U.S. Fish and Wildlife Service Incidental Take Statement requires increased monitoring when American Falls Reservoir content is below 100 KAF and report to the Service when the level is below 50 KAF. Under the statement, Reclamation is allowed limited incidental take of Utah Valvata. The early draft of Lake Walcott is allowed when needed to avoid drafting American Falls Reservoir below 50 KAF or to reduce the duration of American Falls Reservoir contents

being less than 50 KAF. Reclamation must continue to operate within this Reasonable and Prudent Measure and will develop alternative operations of upstream facilities to minimize take and meet water quality standards. However, these RPM's may no longer be required as the Utah Valvata moves forward through the delisting process.

4.3 Water Quality Monitoring

The water quality laboratory is funded through fees charged for each sample analyzed. The number of samples varies by project and the fees can be exchanged for in kind services. The water quality laboratory will continue to collect and analyze samples as part of the American Falls Reservoir monitoring program. The frequency of these monitoring events will continue to be conducted in two out of every three years, with additional sampling events occurring as necessary.

The agreement that Reclamation has with the University of Idaho Extension Services will also be continued for the foreseeable future. This project includes the University of Idaho collecting samples for Reclamation on the Snake River every two weeks. Similarly, the laboratory intends to continue analyzing American Falls Reservoir samples for IDEQ as long as their monitoring project continues.

Along with the Snake River, there are five main tributaries and several other smaller order tributaries that flow into American Falls Reservoir. Of these tributaries, there are 15 segments listed in the 2008 Integrated Report for Impaired Waters for sediment. When TMDLs are developed for these segments, Reclamation will be available to provide technical assistance and/or water quality laboratory services.

4.4 Sediment

Reclamation is committed to continued shoreline protection in American Falls Reservoir. The project has received constant funding since the mid 1990's and will continue to be funded as part of project operations. Efforts will be made to finish stabilizing the remaining shoreline as well as maintaining the previous stabilization efforts. Reclamation will review available BMP's for low water situations in storage reservoirs for applicability and potential success. In addition Reclamation will discuss, at future WAG meetings, the implementation of additional BMPs that may improve water quality conditions in the reservoir and riverine reaches as the shoreline stabilization is completed.

4.5 Water Conservation

Water conservation projects continue to be a priority for Reclamation. These programs for the Minidoka Project vary from year to year depending on the matching funds contributed by spaceholders. Reclamation typically budgets $150,000 to $200,000 per year for Minidoka water conversation projects. Most of these projects involve American Falls Reservoir spaceholders.

4.6 Communication Protocol

Reclamation commits to notifying IDEQ when conditions at American Falls Reservoir have the potential to cause non compliance with water quality standards. Reclamation's advanced notice will explain to the extent possible when the reservoir pool will reach elevations known to be detrimental to water quality below the reservoir and the length of time for which the elevation is expected to be at that level. The notice will also include the steps Reclamation is taking to minimize the length of time and magnitude of any potential exceedance. The notice shall be submitted in accordance with the Lake Walcott TMDL.

Reclamation will continue to participate in WAG and BAG meetings. Additional meetings to exchange information can be scheduled at any time. It may be prudent to schedule annual meetings in July or August to review current water quality conditions or potential water quality problems. In years when threshold storage levels and flows are not approached, Reclamation and IDEQ may both decide that the meeting can be cancelled by exchange of e-mail or phone calls.

4.7 Potential Future Water Quality Enhancement Activities

Through Reclamation's participation in TMDL development and implementation of habitat enhancement programs, additional opportunities exist to improve water quality in and below American Falls Reservoir. Reclamation is committed to implementing water quality projects as they are identified and funded through the three year budgetary process.

In addition, Reclamation proposes to acquire Science and Technology grant funding to assist in analyzing research strategies that may be effective in improving water quality conditions below American Falls. This effort would be particularly focused on the causal influences of increased suspended sediment in the project discharge. This may include a study plan to evaluate relationship of plunging reservoir inflows due to temperature differences, ramping rates, and wind influence on shoreline erosion to sediment discharge. This study plan would also include the appropriate monitoring and data collection necessary to understand these mechanisms. It may also require reduced volumes in American Falls Reservoir to initiate the data gathering effort. Prior to implementation of this study, communication with stakeholders will be performed.

Reclamation is also engaged in habitat enhancement throughout the Upper Snake River Basin. Many of these habitat programs are effective in reducing sediment loading in the River. A portion of these programs involve closing makeshift roads, trails, or other misused areas and replanting them with native grasses and shrubs. These efforts continue as sites are identified. Invasive weed control is a priority in habitat enhancement efforts. Weeds compete for resources with native vegetation and are often not as effective in controlling erosion. Reclamation provides funding to county weed control agencies in the Upper Snake River watershed to aid in invasive weed control.

Rehabilitation of wetlands is another part of the program that aims to control invasive weeds and plants from outcompeting native vegetation and degrading the wetland. The reconditioned wetlands reduce sedimentation in the river and help filter out and assimilate incoming nutrients. Reclamation is engaged in identifying sites that may be appropriate for wetland development. These sites included areas where drains or creeks enter the Snake River after traveling through agricultural areas.

4.8 Summary

Discharges from Reclamation facilities are generally considered non point source pollution. Reclamation voluntarily attempts to meet all water quality objectives and compliance measures while balancing irrigation delivery, contractual storage obligations, endangered species act commitments, and other competing needs. Reclamation will strive to balance all water quality objectives and believes that this is best accomplished by working collaboratively with IDEQ on implementation plans, actively participating in watershed advisory groups, and assisting IDEQ in data collection for TMDL development and review. This action plan is designed to outline those water quality monitoring projects, BMP implementations, and operational considerations that Reclamation will undertake to address water quality issues in the Snake River below American Falls Dam.

APPENDIX C

Water Quality Data

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American Falls Reservoir Water Quality Data

American Falls Reservoir water quality data collected 100 meters from the outlet works (site code AFE009) from 2003 through 2018. Data includes field measurements and nutrient concentrations at differing depths.

Date Sampled	Depth (m)	Field Temp C	Field DO mg/L	Field pH	Field EC uS/cm	NO3/NO2 mg/L	Ortho-P mg/L	Total-P mg/L	NH3 mg/L	TKN mg/L
5/31/2018	1	16.9	8.1	8.09	365	0.06	0.004	0.065	0.08	0.36
6/20/2018	1	17.9	7.6	8.04	347	0.05	0.009	0.025	0.1	0.33
7/16/2018	1	22	12.1	8.22	336	< 0.01	< 0.003	0.02	0.02	0.26
7/25/2018	1	22.3	7.4	8.3	345	< 0.01	< 0.003	0.025	< 0.01	0.45
8/15/2018	1	21.5	5.8	7.78	345	< 0.01	0.004	0.049	< 0.01	0.51
8/15/2018	11	20.7	0.2	7.28	361	< 0.01	0.058	0.103	0.49	0.88
7/25/2018	15	19.4	0.7	7.37	355	0.02	0.005	0.018	0.1	0.26
6/20/2018	17	16.4	3.4	7.6	349	0.05	0.022	0.049	0.26	0.56
7/16/2018	18.2	18.7	2.4	7.43	350	0.05	0.03	0.051	0.21	0.39
5/31/2018	19	13.1	3.9	7.71	380	0.06	0.022	0.206	0.3	1.02
8/14/2017	1	21.6	6.7	7.91	345	0.03	0.01	0.036	0.13	0.5
7/18/2017	1	23.8	9.1	8.25	337	0.01	0.003	0.022	< 0.01	0.36
6/28/2017	1	19.4	8.5	8.23	366	0.08	0.004	0.016	0.04	0.29
5/30/2017	1	18.2	11.6	8.51	383	0.07	0.005	0.025	< 0.01	0.41
8/14/2017	15	18.3	0	7.24	362	< 0.01	0.222	0.302	0.79	1.07
7/18/2017	17	18	2.8	7.62	348	0.1	0.06	0.082	0.24	0.44
6/28/2017	19	16	6.5	7.83	355	0.14	0.019	0.036	0.08	0.25
5/30/2017	19	11.9	6.9	8.05	390	0.16	0.016	0.028	0.1	0.33
7/20/2016	1	20.4	7.9	7.26	439	0.05	0.008	0.023	< 0.01	0.31
6/20/2016	1	18.8	8	7.63	436	0.08	0.015	0.033	0.09	0.34
5/25/2016	1	13.3	8.6	7.85	447	0.18	0.005	0.02	0.08	0.38
7/20/2016	12.8	19.1	4.3	7.96	442	0.11	0.032	0.056	0.1	0.35
6/20/2016	16.2	16.1	1.5	7.86	445	0.07	0.091	0.109	0.32	0.57
5/25/2016	18	12.6	4.2	7.77	452	0.18	0.024	0.05	0.2	0.49
8/24/2015	0					0.04	0.021	0.064	0.19	0.77
8/24/2015	0					0.04	0.027	0.06	0.28	0.71
7/29/2015	0					0.01	0.014	0.041	< 0.01	0.45

Date Sampled	Depth (m)	Field Temp C	Field DO mg/L	Field pH	Field EC uS/cm	NO3/NO2 mg/L	Ortho-P mg/L	T-Phos mg/L	NH3 mg/L	TKN mg/L
7/29/2015	0					0.03	0.023	0.036	0.05	0.25
7/27/2015	0					0.03	0.024	0.058	0.06	0.34
7/27/2015	0					0.03	0.032	0.085	0.11	0.42
6/29/2015	0					0.04	0.189	0.229	0.42	0.62
6/29/2015	0					0.02	< 0.003	0.011	< 0.01	0.16
5/26/2015	0					0.12	0.005	0.011	0.06	0.28
5/26/2015	0					0.12	0.021	0.045	0.18	0.44
8/21/2014	1	21	7.4	8.07	359	0.05	0.019	0.078	0.09	0.84
7/30/2014	1	22.8	11.1	8.24	400	< 0.01	0.007	0.026	0.02	0.4
7/21/2014	1	22.4	7.5	8.02	412	0.02	0.045	0.066	0.09	0.47
6/23/2014	1	18.1	9.1	8.11	425	0.03	< 0.003	0.016	0.02	0.37
5/27/2014	1	14.6	9.1	8.08	438	0.03	< 0.003	0.014	0.06	0.33
7/21/2014	11	20.5	0.5	7.36	425	< 0.01	0.143	0.173	0.47	0.86
8/21/2014	11.6	20.9	6.6	8.03	360	0.05	0.023	0.121	0.17	0.67
7/30/2014	11.7	21.6	5.4	7.85	413	0.01	0.023	0.065	0.09	0.48
6/23/2014	15	16.3	6.4	7.91	425	0.04	0.014	0.049	0.12	0.38
5/27/2014	18	11.4	6.7	7.83	441	0.03	0.014	0.032	0.13	0.42
7/12/2013	1	21.6	7.8	8.39	453	0.06	0.013	0.045	0.05	0.43
6/24/2013	1	18.7	7.8	7.9	455	0.09	0.014	0.03	0.08	0.33
7/12/2013	13.5	18.9	0.6	7.72	466	0.07	0.095	0.139	0.24	0.58
6/24/2013	15.9	16.8	5	7.62	457	0.09	0.025	0.048	0.12	0.32
7/23/2012	1	23.1	10.5	8.72	381	< 0.01	< 0.003	0.035	< 0.01	0.56
7/23/2012	12.9	20.8	1.3	7.8	410	< 0.01	0.005	0.053	0.09	0.45
8/9/2011	1	22.1	12.2	8.88	299	< 0.01	< 0.003	0.037		0.78
8/9/2011	20.1	18.5	0.6	7.44	313	0.02	0.097	0.111		0.35
7/19/2010	1	18.9	7.4	8.55	429	0.02	0.016	0.038		0.29
7/19/2010	17.5	16.9	3.4	8.06	435	0.06	0.109	0.163		0.46
7/27/2009	1	23.2	9.4	8.49	358	< 0.01	< 0.003	0.015		0.36
7/27/2009	18.1	17.2	0.2	7.37	356	0.03	0.201	0.22		0.61

Date Sampled	Depth (m)	Field Temp C	Field DO mg/L	Field pH	Field EC uS/cm	NO3/NO2 mg/L	Ortho-P mg/L	Total-P mg/L	NH3 mg/L	TKN mg/L
6/29/2007	1	20.4	8	8.26	464	0.08	0.051	0.081		0.4
6/29/2007	15.2	17.4	2.1	7.96	468	0.09	0.08	0.103		0.4
7/31/2006	1	22.6	7	8.77	397	0.01	0.075	0.099		0.47
7/31/2006	15.1	18.8	0.1	7.81	399	< 0.01	0.38	0.4		0.95
6/21/2004	1	17.4	7.5	8.66	428	0.02	0.026	0.043		0.32
6/21/2004	15.2	15.2	4.2	8.34	435	0.02	0.025	0.045		0.29
7/15/2003	1	23.2	7.7	8.61	454	0.07	0.052	0.082		0.43
7/15/2003	10.9	20.4	1.3	7.94	461	0.1	0.089	0.113		0.51

Measured water parameters such as DO concentrations were predictable with the lowest concentrations at depth. The pH ranged between 7.2 and 8.8, with most water samples being more alkaline than neutral. Nitrate, nitrite, and ammonia concentrations are notably low, however total phosphorus concentrations were somewhat high, with 30 out of 64 samples being over 0.05 mg/L.

American Falls Reservoir water quality data collected 100 meters from the outlet works (site code AFE009) from 2003 through 2018. Data includes alkalinity, cation and anion concentrations at differing depths.

Date Sampled	Depth (m)	Alkalinity mg/L	SO4 mg/L	Cl mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	SiO2 mg/L	Fl mg/L	As ug/L	Se ug/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Fe ug/L	Mn ug/L	Zn ug/L
8/15/2018	1	128	30.7	12.5	34.1	11.8	13.2	2.4	15.7	0.51	2.4	< 2	< 2	< 2	< 2	6.67	26.1	28.6	< 5
7/25/2018	1	134	28.8	10.5	39.5	11.7	12.4	2.4		0.49	2.43	< 2	< 2	< 2	< 2	5.49	21.8	< 10	< 5
7/16/2018	1	135	28.4	10.1	40.3	11.1	11.5	2.2		0.48	2.47	< 2	< 2	< 2	< 2	5.82	25.7	< 10	5.28
6/20/2018	1	135	30.1	9.8	40.5	11	11.2	2.2		0.47	3.24	< 2	< 2	< 2	< 2	8.76	264	66.3	6.95
5/31/2018	1	137	34.7	11.1	42.1	11.7	12.2	2.2		0.51	2.16	< 2	< 2	< 2	2.12	7.3	32	12.4	< 5
8/15/2018	11	137	28.6	12.4	37.1	11.9	13.2	2.5	17.5	0.51	2.08	< 2	< 2	< 2	< 2	7.8	43.8	198.3	< 5
7/25/2018	15	139	28.3	10.1	41.9	11.5	11.9	2.4		0.48	2.78	< 2	< 2	< 2	< 2	5.61	21	14.9	< 5
6/20/2018	17	137	30.5	9.7	40.8	11	11.2	2.2		0.49	3.05	< 2	< 2	< 2	< 2	6.45	36.1	< 10	< 5
7/16/2018	18.2	139	28	9.8	40.7	10.8	11.2	2.2		0.46	3.01	< 2	< 2	< 2	< 2	9.58	303.6	36.1	< 5
5/31/2018	19	145	37.9	11.9	42.4	11.9	12.5	2.2		0.55	2.94	< 2	< 2	< 2	< 2	12.09	1133.4	136.4	< 5
8/14/2017	1	134	27.4	10.8	39.2	12	12	2.3	11.7	0.44	2.04	2.6	< 2	< 2	< 2	13.08	29.4	24.1	< 5
7/18/2017	1	139	27.2	10.3	40.1	11.4	12	2.3	11.3	0.41	2.25	4.19	< 2	< 2	2.48	8.99	14.5	< 10	< 5
6/28/2017	1	149	29.7	11.7	43.2	11.5	12.3	2.3	11.5	0.48	2.41	< 2	< 2	< 2	9.36	16.8	31	< 10	14.52
5/30/2017	1	149	34.2	13.6	44.3	13	12.9	2.5	11.6	0.5	< 2	< 2	< 2	< 2	< 2	17.08	33.9	< 10	< 5
8/14/2017	15	152	23.6	10.1	43.4	11.8	11.4	2.4	17.6	0.42	3.01	3.07	< 2	< 2	3.31	20	202.1	546.3	< 5
7/18/2017	17	144	25.5	< 0.4	40.2	10.5	10.7	2.1	14.8	0.39	3.45	< 2	< 2	< 2	2.98	15.42	174.3	125.6	8.8
6/28/2017	19	145	27.9	10.5	41.4	11.2	11.3	2.2	12.4	0.44	2.28	< 2	< 2	< 2	4.29	18.33	130.5	13	< 5
5/30/2017	19	152	35.1	13.9	44.5	13	13.1	2.5	12.4	0.46	2.35	< 2	< 2	< 2	< 2	23.1	138	13.8	< 5
7/20/2016	1	160	42.3	17.7	47.2	14.4	19.4	3.2	17.1	0.65	3.11	< 2	< 2	< 2	< 2	14.15	109.6	< 10	< 5
6/20/2016	1	157	41	18.4	43.6	13.7	18.4	3	11.7	0.72	4.26	< 2	< 2	< 2	< 2	17.08	29.4	14.5	26.61
5/25/2016	1	161	43.4	21.7	45.4	14.9	21.7	3.5	15.7	0.86	5.17	< 2	< 2	< 2	< 2	< 2	41	< 10	< 5
7/20/2016	12.8	160	41.9	17.4	47.1	14.1	19.2	3.2	18.6	0.63	3.5	< 2	< 2	< 2	< 2	23.31	404.4	27.2	< 5
6/20/2016	16.2	161	40.1	18.9	44.5	14	19	3.1	15.1	0.77	4.52	< 2	< 2	< 2	2.29	22.94	189.5	129.2	10.36
5/25/2016	18	163	43	21.5	43.2	14.8	21.1	3.6	17	0.86	3.86	< 2	< 2	< 2	< 2	2.16	312.6	58.2	< 5
8/24/2015	0	148	39.4	16.2	41.1	14.4	15.8	3.1		0.53									
8/24/2015	0	150	39.1	16.1	40.2	14.3	16.8	3		0.52									
7/29/2015	0	161	39.2	15.5	46.5	14.1	15.9	2.8		0.63									

Date Sampled	Depth (m)	Alkalinity mg/L	SO4 mg/L	Cl mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	SiO2 mg/L	Fl mg/L	As ug/L	Se ug/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Fe ug/L	Mn ug/L	Zn ug/L
7/29/2015	0	160	39.4	15.6	45.9	14.3	15.6	2.8		0.63									
7/27/2015	0	162	40.1	15.8	42.7	13.7	16.6	2.8	13.6	0.68									
7/27/2015	0	161	40.2	16	48	14.5	16.6	2.9	14.1	0.7									
6/29/2015	0	162	37.4	15.9	46.3	14.6	18	3		0.73									
6/29/2015	0	152	38.8	15.2	43	13.7	15.4	2.8		0.67									
5/26/2015	0	162	40.5	18.6	45.6	15.2	19.2	3.3		0.75									
5/26/2015	0	163	40.6	19.1	45.7	15.2	20	3.3		0.75									
8/21/2014	1	138	32.3	12.3	40	12.3	12.1	2.8		0.59									
7/30/2014	1	148	37.1	16.1	40.5	14	16.5	3.1	18.5	0.61									
7/21/2014	1	156	36	15.6	44.4	14.1	16.6	3.1		0.6									
6/23/2014	1	155	40.2	17	45	14.5	20	3.1		0.63									
5/27/2014	1	159	44.9	19.8	44.7	15.7	20.3	3.6		0.79									
7/21/2014	11	166	35	15.8	46	14.4	16.9	3.3		0.65									
8/21/2014	11.6	144	32.1	11.9	40.4	13.8	13.8	2.9		0.58									
7/30/2014	11.7	156	36.9	16.1	42.8	14.4	16.7	3.1	18.8	0.63									
6/23/2014	15	169	40	16.7	45.5	14.5	17.6	3.1		0.66									
5/27/2014	18	161	44.4	20	44.2	15.7	20	3.7		0.82									
7/12/2013	1	162	42.8	19.4	46.6	14.9	18.8	3.4	14.6	0.74							133.7	< 10	9.95
6/24/2013	1		42.9	19.4	48.6	14.9	19.4	3.4		0.82									
7/12/2013	13.5	165	42	19.5	47.6	14.9	19	3.4	19.2	0.74							314.2	138.8	13.12
6/24/2013	15.9		42.9	19.4	48.6	14.9	19.4	3.4		0.83									
7/23/2012	1	139	34.8	15	40.9	14.4	16.1	2.9	12.8	0.75	4	< 2	< 1	< 2	< 2	< 2	< 20	< 10	< 5
7/23/2012	12.9	148	37.5	15.9	42.4	14.2	16	2.9	13.3	0.65	5	< 2	< 1	< 2	< 2	< 2	240	30	< 5
8/9/2011	1	132	22.4	8.4	42.5	10.7	10.3	2.1	9.2	0.5	3	< 2	< 1	< 2	< 2	< 2	30	< 10	< 5
8/9/2011	20.1	131	21.1	8.1	41.9	10.4	10	2.2	12.1	0.5	4	< 2	< 1	< 2	< 2	< 2	80	98	< 5
7/19/2010	1	152	37.7	15.7	47.3	14.1	16.8	3	10	0.76	2	< 2	< 1	< 2	< 2	< 2	50	10	< 5
7/19/2010	17.5	156	37.1	15.8	47.3	14	17.2	3.1	14.4	0.81	3	< 2	< 1	< 2	< 2	< 2	200	143	< 5
7/27/2009	1	142	32.1	12.8	45.7	12.5	13.6	2.5	7	0.57	3	< 2	< 1	< 2	< 2	< 2	30	< 10	< 5
7/27/2009	18.1	143	27.6	11.3	44.9	11.8	12.3	2.6	14.2	0.54	4	< 2	< 1	< 2	< 2	< 2	150	287	< 5

Date Sampled	Depth (m)	Alkalinity mg/L	SO4 mg/L	Cl mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	SiO2 mg/L	Fl mg/L	As ug/L	Se ug/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Fe ug/L	Mn ug/L	Zn ug/L
6/29/2007	1		41.5	19.2	49.3	15.9	19.6	3.4	16.1	0.74	4	< 2	< 1	< 2	< 2	< 2	70	< 10	< 5
6/29/2007	15.2		41	18.9	48.7	15.7	19.5	3.4	17.4	0.74	3	< 2	< 1	< 2	< 2	< 2	130	10	< 5
7/31/2006	1		33	15.4	45.8	13.5	15.4	2.9	14.2	0.64	3	< 2	< 1	< 2	< 2	< 2	40	40	< 5
7/31/2006	15.1		28.8	14.2	45.9	13	14.2	2.9	21	0.63	4	< 2	< 1	< 2	< 2	< 2	130	470	< 5
6/21/2004	1		43.4	19.7	48.9	15.9	21	3.4	10.8	0.84	3	< 2	< 1	< 2	< 2	< 2	110	40	70
6/21/2004	15.2		44.8	20.6	50.7	16.4	21	3.4	10.9	0.75	3	< 2	< 1	< 2	< 2	< 2	120	30	< 5
7/15/2003	1		43.7	21.1	47.3	16.5	21.4	3.6	20	0.84	4	< 2	< 1	< 2	< 2	< 2	120	20	< 5
7/15/2003	10.9		43.3	20.9	47.7	16.3	21.6	3.6	23	0.85	4	< 2	< 1	< 2	< 2	< 2	120	70	6

Alkalinity ranged between 128 to 169 mg/L, and the major anions and cations show no alarming trends. Many water samples have trace metal concentrations higher than testing equipment detection limits such as arsenic (concentration ranged from less than 2 to 5.17 µg/L) and lead (concentrations ranged from less than 2 to 23.31 µg/L). Two water samples contained 3.07 and 4.19 µg/L of selenium, and the remaining 38 water samples were less than detection limits of 2 µg/L.

American Falls Reservoir water quality data collected 100 meters from the outlet works (site code AFE009) from 2003 through 2018. Data includes total suspended solids, turbidity, E. coli, and chlorophyll a at differing depths.

Date Sampled	Depth (m)	TSS mg/L	Turbidity NTU	E. coli ct/100mL	Chl a mg/L
5/31/2018	1	5	1	< 10	0.0228
6/20/2018	1	< 1	1	< 2	0.0214
7/16/2018	1	2	2	< 2	0.0062
7/25/2018	1	5	5	< 2	0.0015
8/15/2018	1	5	3	< 2	0.0011
8/15/2018	11	4	7	52	
7/25/2018	15	2	2	< 2	
6/20/2018	17	7	8	< 2	
7/16/2018	18.2	3	3	< 2	
5/31/2018	19	57	27	< 10	
8/14/2017	1	4	2	2	0.0137
7/18/2017	1	3	1	< 2	0.0127
6/28/2017	1	2	1	< 2	0.0074
5/30/2017	1	2	1	2	0.0044
8/14/2017	15	6	5	180	
7/18/2017	17	7	5	< 2	
6/28/2017	19	4	3	< 2	
5/30/2017	19	4	3	< 2	
7/20/2016	1	4	3	< 2	0.013
6/20/2016	1	3	< 1	< 2	0.0021
5/25/2016	1	2	1		
7/20/2016	12.8	12	10	< 2	
6/20/2016	16.2	6	4	< 2	
5/25/2016	18	13	8		
8/24/2015	0				>0.00006
8/24/2015	0				0.0358
7/29/2015	0				0.0268

Date Sampled	Depth (m)	TSS mg/L	Turbidity NTU	E. coli ct/100mL	Chl a mg/L
7/27/2015	0	11	8	< 2	0.0046
7/27/2015	0	19	15	< 2	0.0003
6/29/2015	0				
6/29/2015	0				
5/26/2015	0				
5/26/2015	0				
8/21/2014	1				
7/30/2014	1	2	2	< 2	0.0632
7/21/2014	1				0.0112
6/23/2014	1				0.0089
5/27/2014	1				0.0075
7/21/2014	11				0.0017
8/21/2014	11.6				
7/30/2014	11.7	22	12	< 2	
6/23/2014	15				
5/27/2014	18				
7/12/2013	1	5	4	< 2	
6/24/2013	1				0.0128
7/12/2013	13.5	13	12	< 2	0.0032
6/24/2013	15.9				
7/23/2012	1	9	7	< 2	
7/23/2012	12.9	15	11	< 2	0.0287
8/9/2011	1	6	8	< 2	
8/9/2011	20.1	3	2	< 2	0.0396
7/19/2010	1	2	2	< 2	
7/19/2010	17.5	8	4	< 2	0.0061
7/27/2009	1	2	4	< 2	
7/27/2009	18.1	5	3	< 2	0.016

Date Sampled	Depth (m)	TSS mg/L	Turbidity NTU	E. coli ct/100mL	Chl a mg/L
6/29/2007	1	3	2	< 2	0.008
6/29/2007	15.2	4	3	< 2	
7/31/2006	1	3	2	< 2	0.008
7/31/2006	15.1	6	3	12	
6/21/2004	1	3	2	< 2	0.008
6/21/2004	15.2	4	2	6	
7/15/2003	1	5	4	< 2	0.0061
7/15/2003	10.9	4	3	< 2	

*measured by volume

Total suspended solids and turbidity were low, with the highest concentration/value being 57 mg/L and 27 NTUs, respectively. Most of the water samples were less than 10 mg/L or NTUs. E. coli concentration were also very low, with most samples less than the detection limit of 2 organisms/100 mL. There was one sample in 2017 that was 180 organisms/100 mL, but that is less than half the concentration necessary to affect Idaho State's Primary Contact Recreation beneficial use criteria of a single sample maximum of more than 406 organisms/100 mL. A target of 0.015 mg/L of Chlorophyll-a has been recommended by IDEQ. There are eight water samples out of 31 samples that are above 0.015mg/L. Chlorophyll-a concentrations ranged from below detection limit to 0.06 mg/L.

American Falls Reservoir water quality data collected at reservoir surface near the boat ramp (site code AFE010) in 2017. Data includes nutrient concentrations and chlorophyll a.

Date Sampled	NO3/NO2 mg/L	Ortho-P mg/L	Total-P mg/L	NH3-Diss mg/L	TKN mg/L	Chl a mg/m3
11/29/2017	0.08	< 0.003	0.021		0.36	0.0099
9/27/2017	0.05	0.005	0.032		0.48	0.0122
8/30/2017	< 0.01	0.004	0.018	< 0.01	0.28	0.009
8/15/2017	0.01	0.018	0.041	0.16	0.44	0.0073
7/31/2017	< 0.01	< 0.003	0.02	< 0.01	0.42	0.0168
7/6/2017	< 0.01	0.003	0.029	0.02	0.7	0.0324
6/19/2017	0.16	0.012	0.024	0.06	0.26	0.005
5/3/2017	0.12	0.004	0.016	0.04	0.31	0.0112
4/11/2017	0.22	0.005	0.024	0.04	0.32	0.0115
3/29/2017	0.3	< 0.003	0.022	0.03	0.42	0.0234
1/18/2017	0.56	0.01	0.031	0.07	0.3	0.017

Nutrient concentrations are low except for total phosphorus and are similar to concentrations found in American Falls Reservoir water quality data collected 100 meters from the outlet works (first table). A target of 0.015 mg/L of Chlorophyll-a has been recommended by IDEQ. There are 5 water samples out of 11 samples that are above 0.015mg/L. Chlorophyll-a concentrations ranged from below .005 to 0.032 mg/L.

American Falls Dam outlet works water quality data (site code AFE101) collected from 2003 through 2016. Data includes surface field measurements, alkalinity and nutrient concentrations.

Date Sampled	Field Temp C	Field DO mg/L	Field pH	Field EC uS/cm	Alkalinity mg/L	NO3/NO2 mg/L	Ortho-P mg/L	Total-P mg/L	NH3-Diss mg/L	NH3 mg/L	TKN mg/L
7/27/2015	20.5	6.9	8.49	411	159	0.03	0.024	0.064	0.06		0.37
7/30/2014	22.7	9	8.21	404	155	0.05	0.018	0.051	0.05		0.77
7/12/2013	21	6.7	8.17	460	162	0.08	0.046	0.08	0.12		0.48
7/23/2012	22.5	8	8.55	389	145	0.02	0.01	0.065	0.05		0.53
8/9/2011	21.6	9.1	8.75	303	132	0.02	0.011	0.048		0.02	0.63
7/19/2010	18.3	6.9	8.52	433	154	0.05	0.04	0.071		0.09	0.64
7/27/2009	21.4	6.9		358	143	0.03	0.038	0.058		0.07	0.36
6/29/2007	19.3	7.4	8.24	464		0.08	0.062	0.093		0.05	0.58
7/31/2006	21.4	4.8	8.38	401		0.04	0.2	0.21		0.26	0.62
6/21/2004						0.02	0.022	0.049		0.07	0.42
7/15/2003	22.3	6.7	8.57	453		0.1	0.068	0.102		0.11	0.42

Parameter concentrations are directly related to reservoir water quality parameters and follow similar patters with pH and nutrient concentrations as mentioned in the previous tables.

American Falls Dam outlet works water quality data (site code AFE101) collected from 2003 through 2016. Data includes surface water cation and anion concentrations.

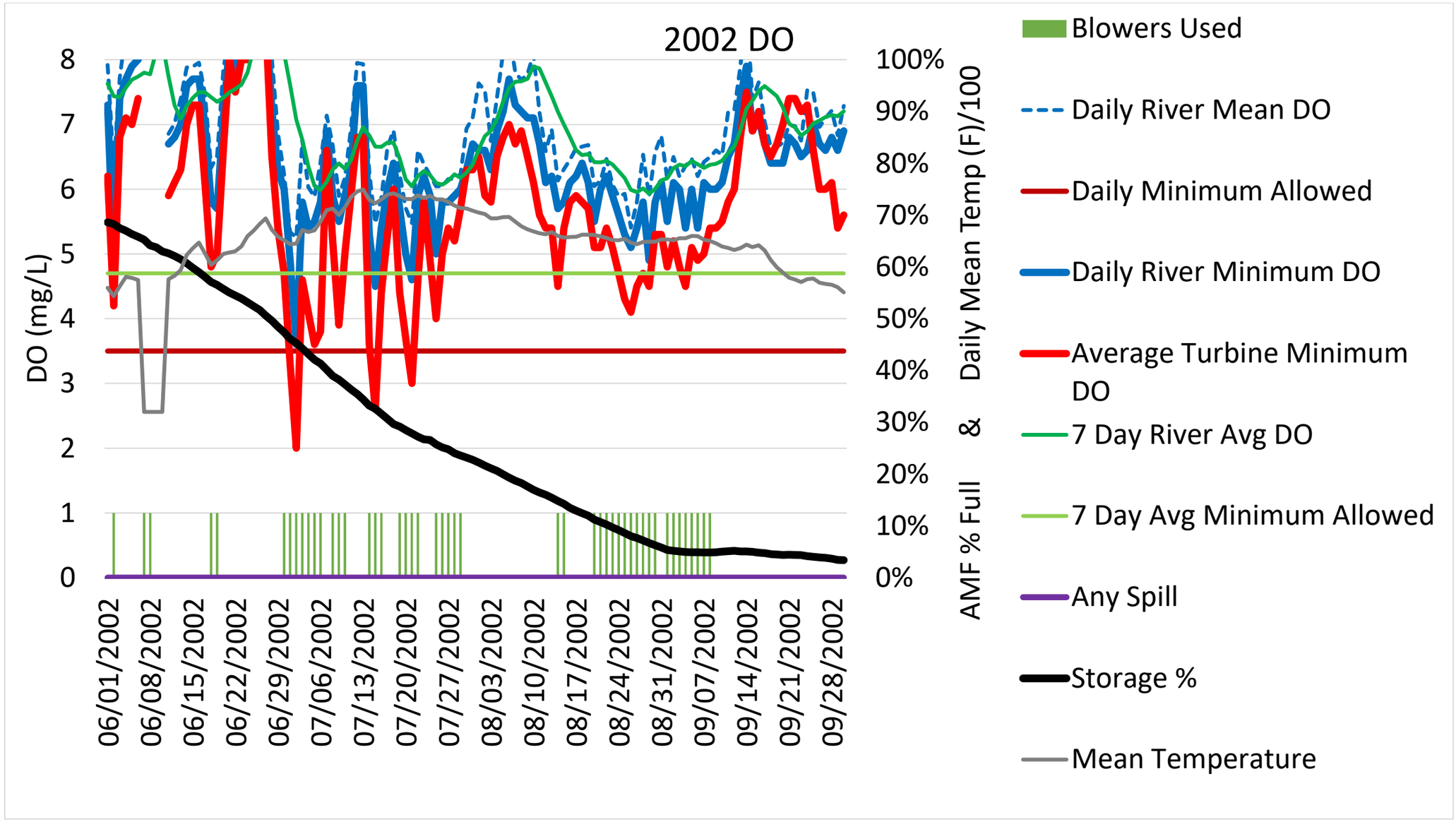
Date Sampled	SO4 mg/L	Cl mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	SiO2 mg/L	Fl mg/L	Boron ug/L	As ug/L	Se ug/L	Hg ng/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Fe ug/L	Mn ug/L	Zn ug/L
7/27/2015	40.4	15.9	45.1	14.4	16.4	2.8	14	0.68											
7/30/2014	38.5	18.1	42.5	14.6	17.7	3.3	19.3	0.64											
7/12/2013	42.5	19.5	47.1	14.9	18.8	3.4	14.4	0.75									288.3	78.6	14.3
7/23/2012	36.3	15.2	42.1	14.4	16.7	3	13.6	0.75		5	< 2		< 1	< 2	< 2	< 2	100	40	27
8/9/2011	22.5	8.8	41.9	10.7	10.4	2.2	9.5	0.53		3	< 2		< 1	< 2	< 2	< 2	40	15	< 5
7/19/2010	38.1	16	47.7	14.1	17	3.2	11	0.8		3	< 2		< 1	< 2	< 2	< 2	40	36	< 5
7/27/2009	30.1	12.2	44.7	12.3	12.9	2.5	8.6	0.54		3	< 2	< 0.2	< 1	< 2	< 2	< 2	70	54	< 5
6/29/2007	41.3	19	48.7	16.3	19.7	3.4	16.5	0.74		3	< 2	< 0.2	< 1	< 2	< 2	< 2	140	10	< 5
7/31/2006	32.1	15.2	46.5	13.5	15.2	3	17	0.64		3	< 2	< 0.2	< 1	< 2	< 2	< 2	60	200	< 5
6/21/2004	43.4	19.8	49.1	15.7	21	3.4	10.8	0.76	110	3	< 2	< 0.2	< 1	< 2	< 2	< 2	90	30	< 5
7/15/2003	43.7	21.2	46.9	16.6	24.5	3.6	22.2	0.85	110	4	< 2	< 0.2	< 1	< 2	< 2	< 2	90	50	< 5

The major anions and cations show no alarming trends. Most of the tested trace metals were below detection limits for the water quality laboratory equipment. Arsenic concentrations are low but detectible and ranged between 3 and 5 µg/L.

American Falls Dam outlet works water quality data (site code AFE101) collected from 2003 through 2016. Data includes surface water sediment concentrations, E. coli, fecal coliform, and per cent dissolved gas.

Date Sampled	TDS mg/L	TSS mg/L	SSC mg/L	Turbidity NTU	E. coli ct/100mL	Fecal ct/100mL	Diss. Gas %
9/7/2016	235		6				
7/27/2015	248	13		11	< 2	2	100.4
7/30/2014	251	10		6	2	4	
7/12/2013	262	11		8	< 2	< 2	105.4
7/23/2012	232	10		8	< 2	< 2	99.7
8/9/2011	188	5		4	< 2	< 2	107.1
7/19/2010	243	2		2	< 2	< 2	104.6
7/27/2009	212	2		2	24	56	106.7
6/29/2007	270	8		3	< 2	2	101.2
7/31/2006	240	4		2	26	8	102.1
6/21/2004	261	5		3	2	4	101.7
7/15/2003	283	4		3	4	40	99.5

Total dissolved solids, total suspended solids, suspended sediment concentrations and turbidity are all measure of sedimentation. These parameter concentrations are low except for total dissolved solids, which ranged between 188 to 283 mg/L. E. coli and fecal coliform concentrations were also low. Dissolved gas percentages ranged between 99.5 to 107.1%, and are within the state's dissolved gas standard of 110%.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DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
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1
2
3
4
5
6
7
8
0%
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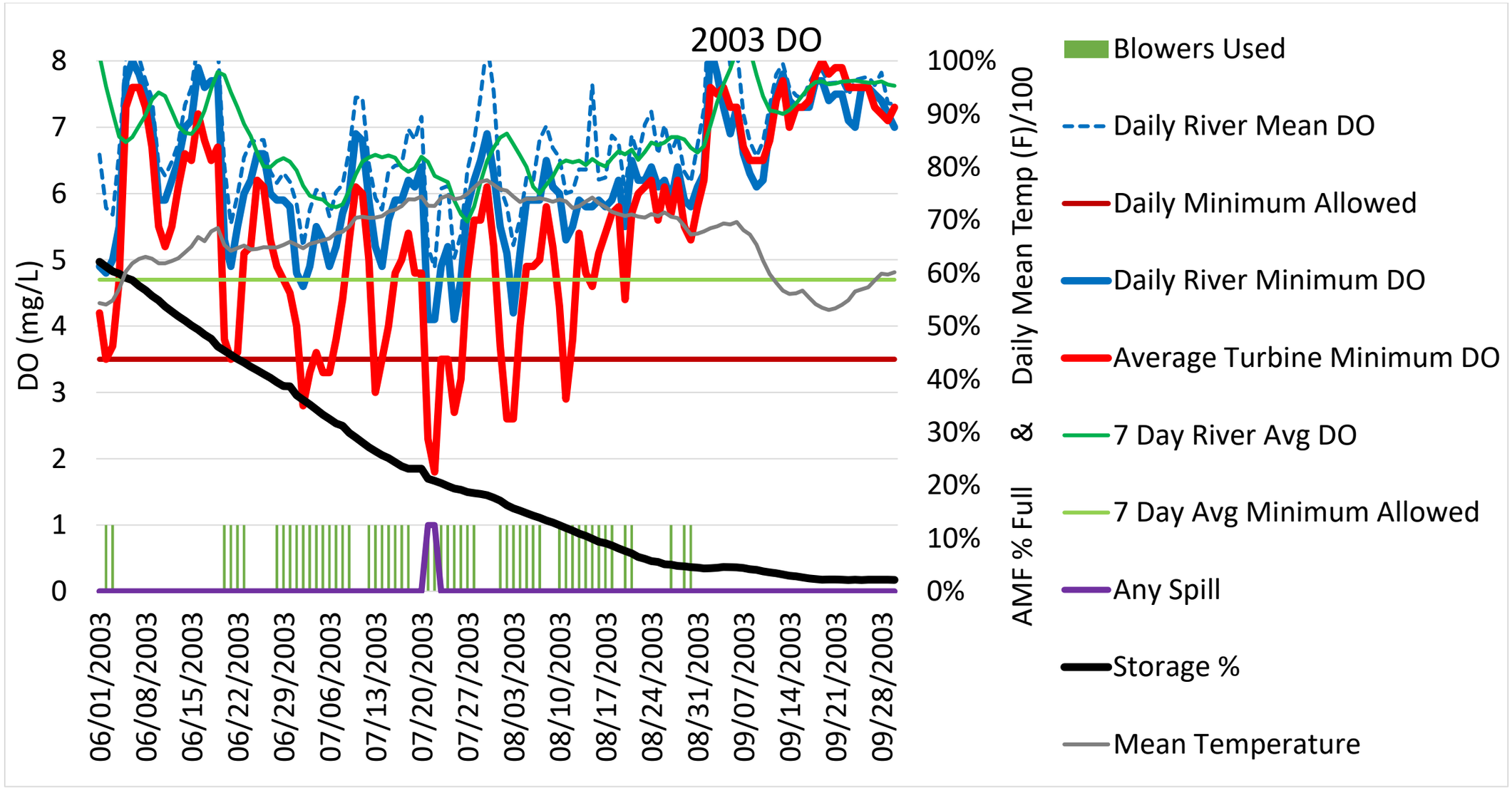
20%
30%
40%
50%
60%
70%
80%
90%
100%
06/01/2002
06/08/2002
06/15/2002
06/22/2002
06/29/2002
07/06/2002
07/13/2002
07/20/2002
07/27/2002
08/03/2002
08/10/2002
08/17/2002
08/24/2002
08/31/2002
09/07/2002
09/14/2002
09/21/2002
09/28/2002
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature


2003 DO
DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
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2
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4
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8
0%
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30%
40%
50%
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70%
80%
90%
100%
06/01/2003
06/08/2003
06/15/2003
06/22/2003
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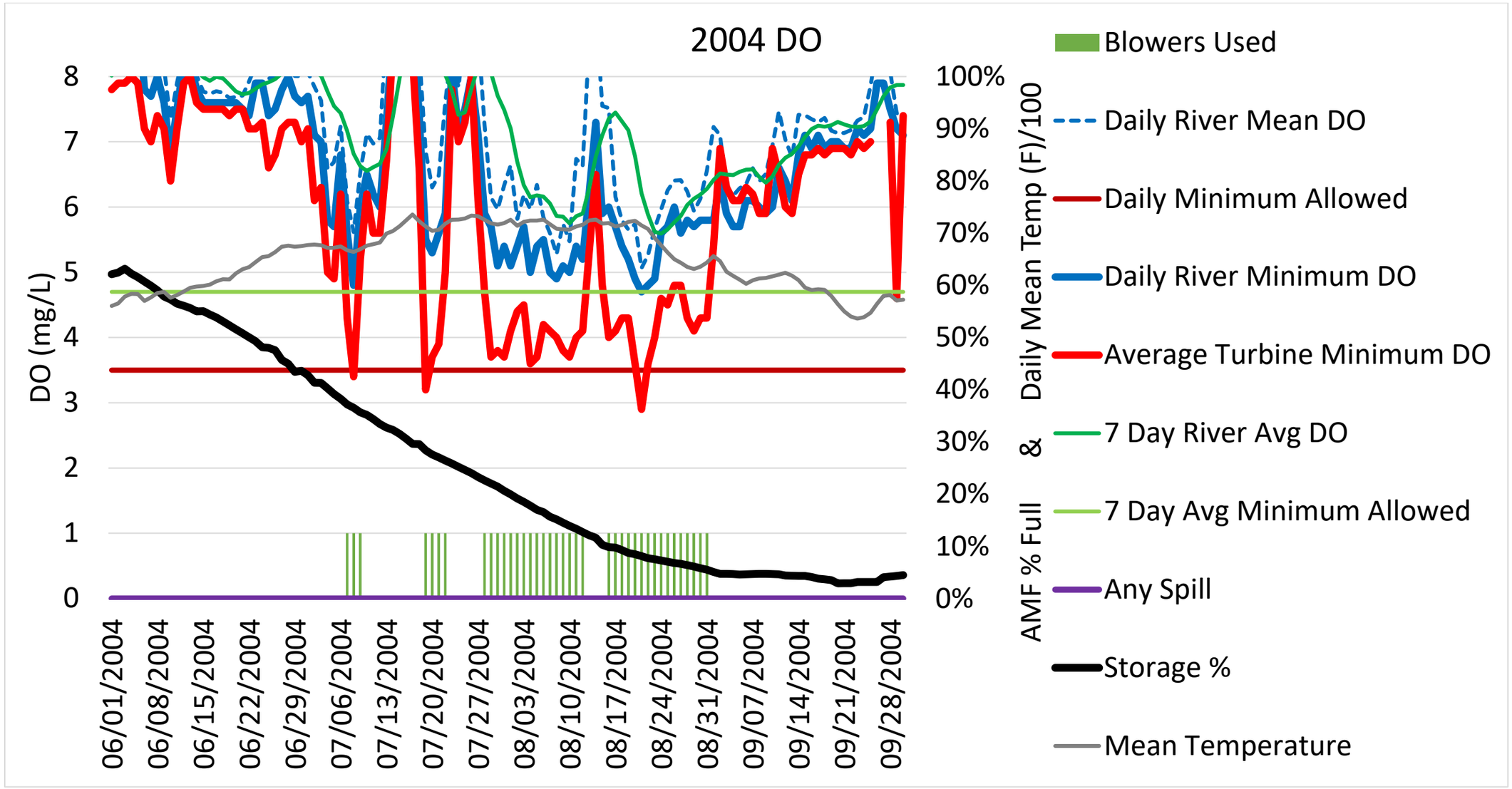
07/27/2003
08/03/2003
08/10/2003
08/17/2003
08/24/2003
08/31/2003
09/07/2003
09/14/2003
09/21/2003
09/28/2003
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
Daily Mean Temp (F)/100 & AMF % Full
8
7
6
5
4
3
2
1
0
100%
90%
80%
70%
60%
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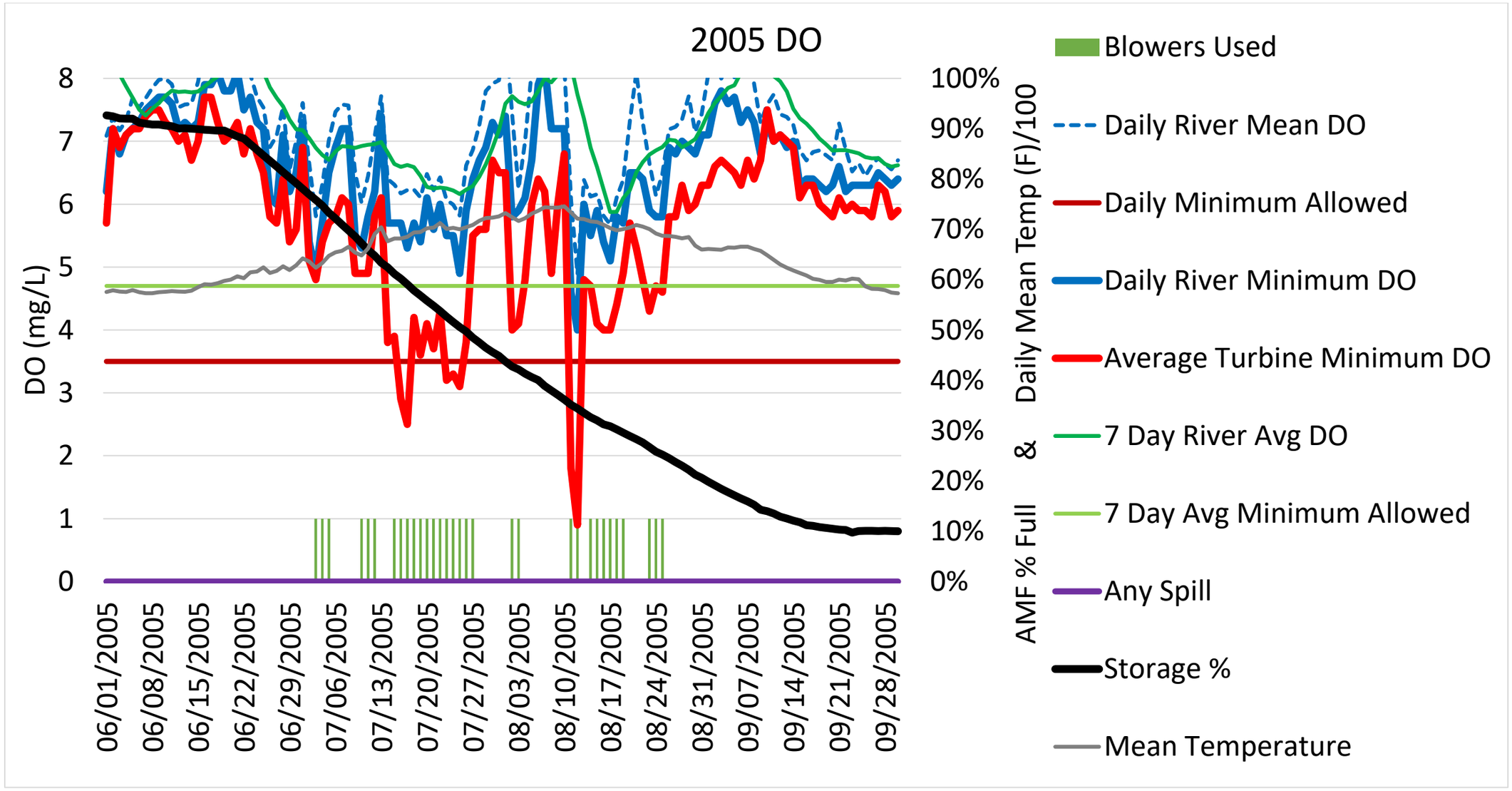
40%
30%
20%
10%
0%
06/01/2004
06/08/2004
06/15/2004
06/22/2004
06/29/2004
07/06/2004
07/13/2004
07/20/2004
07/27/2004
08/03/2004
08/10/2004
08/17/2004
08/24/2004
08/31/2004
09/07/2004
09/14/2004
09/21/2004
09/28/2004
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
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1
2
3
4
5
6
7
8
0%
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20%
30%
40%
50%
60%
70%
80%
90%
100%
06/01/2005
06/08/2005
06/15/2005
06/22/2005
06/29/2005
07/06/2005
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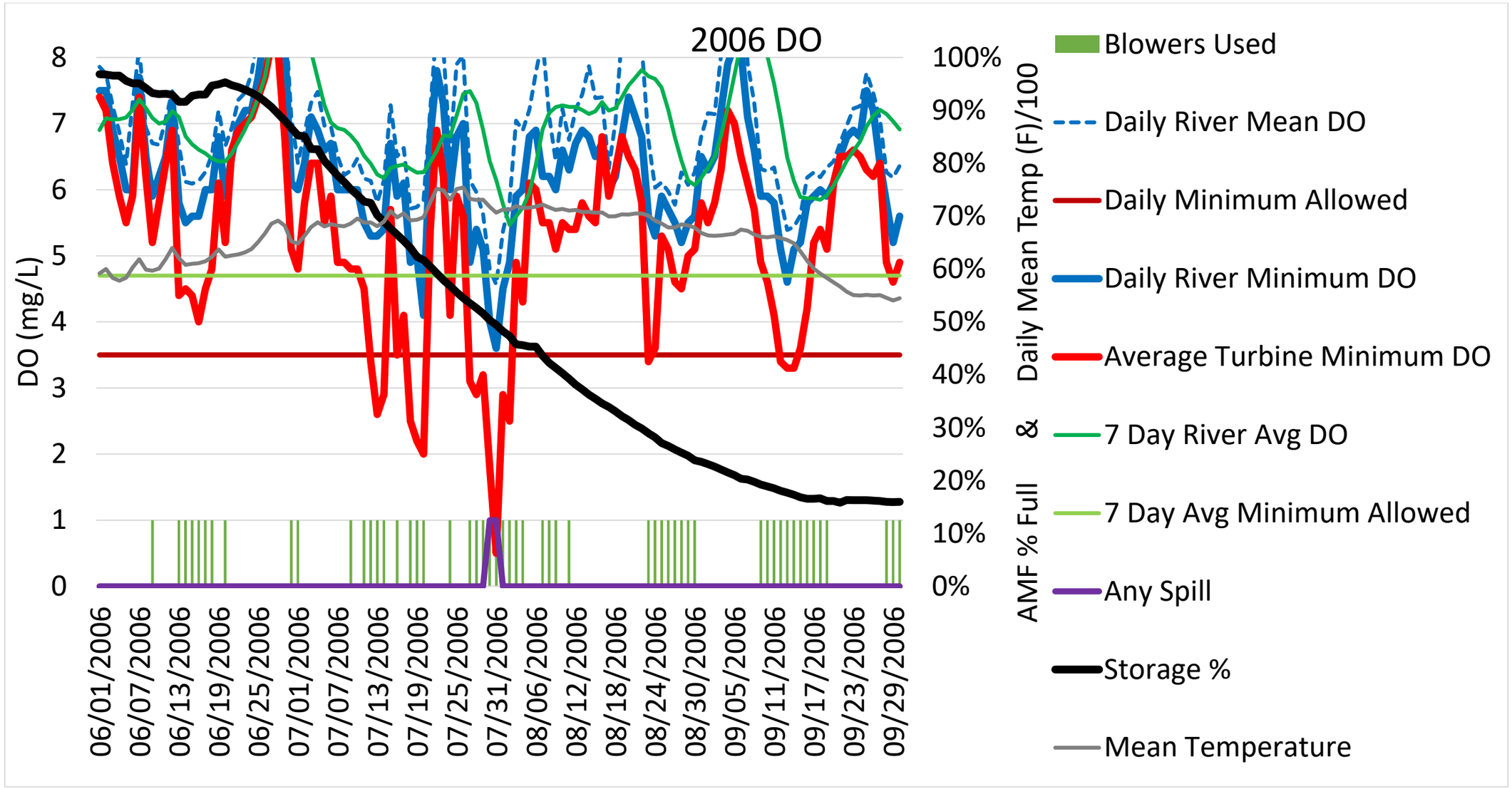
07/27/2005
08/03/2005
08/10/2005
08/17/2005
08/24/2005
08/31/2005
09/07/2005
09/14/2005
09/21/2005
09/28/2005
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
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1
2
3
4
5
6
7
8
0%
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30%
40%
50%
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70%
80%
90%
100%
06/01/2006
06/07/2006
06/13/2006
06/19/2006
06/25/2006
07/01/2006
07/07/2006
07/13/2006
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07/25/2006
07/31/2006
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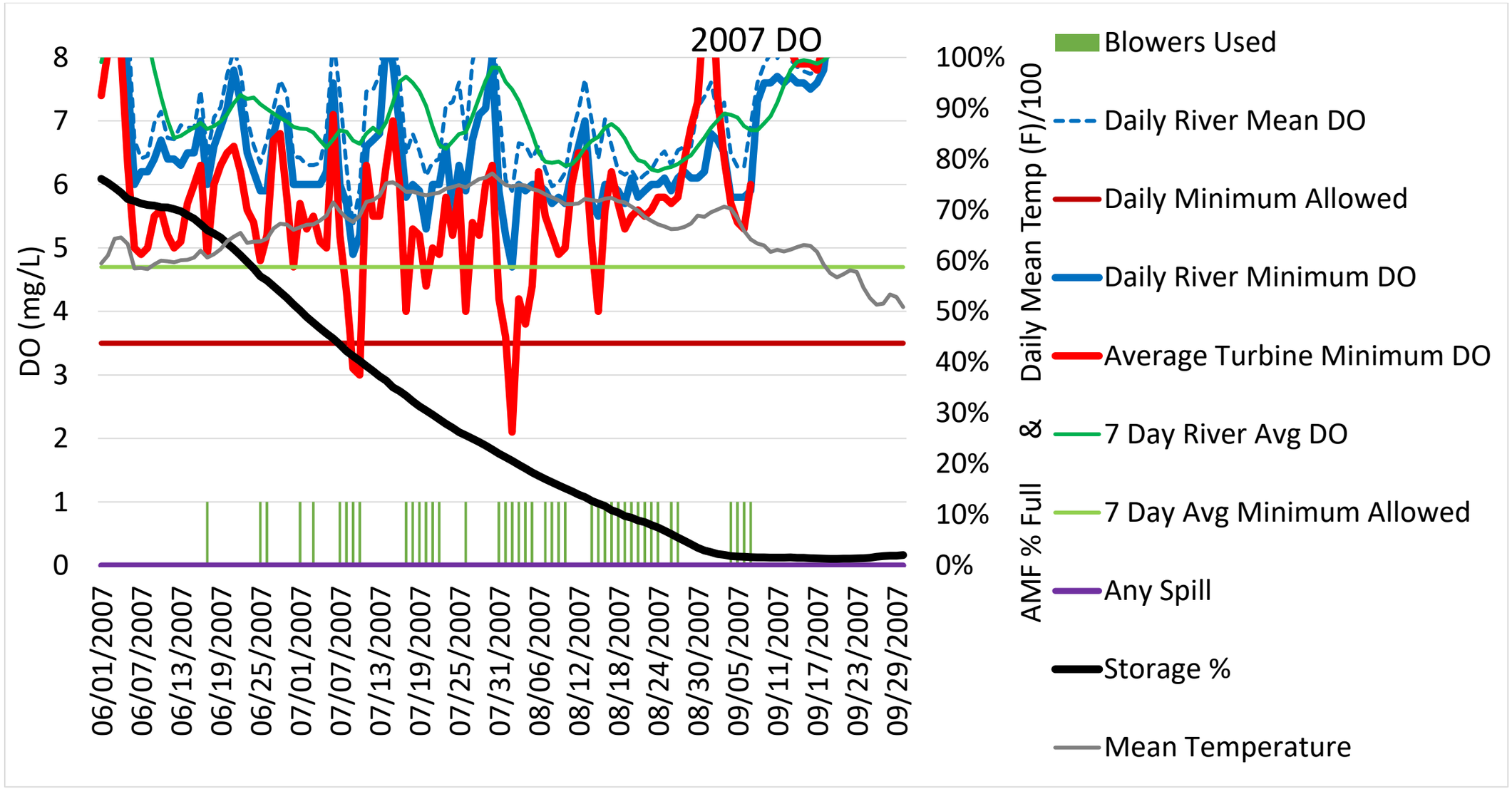
08/12/2006
08/18/2006
08/24/2006
08/30/2006
09/05/2006
09/11/2006
09/17/2006
09/23/2006
09/29/2006
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
0
1
2
3
4
5
6
7
8
0%
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20%
30%
40%
50%
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70%
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100%
06/01/2007
06/07/2007
06/13/2007
06/19/2007
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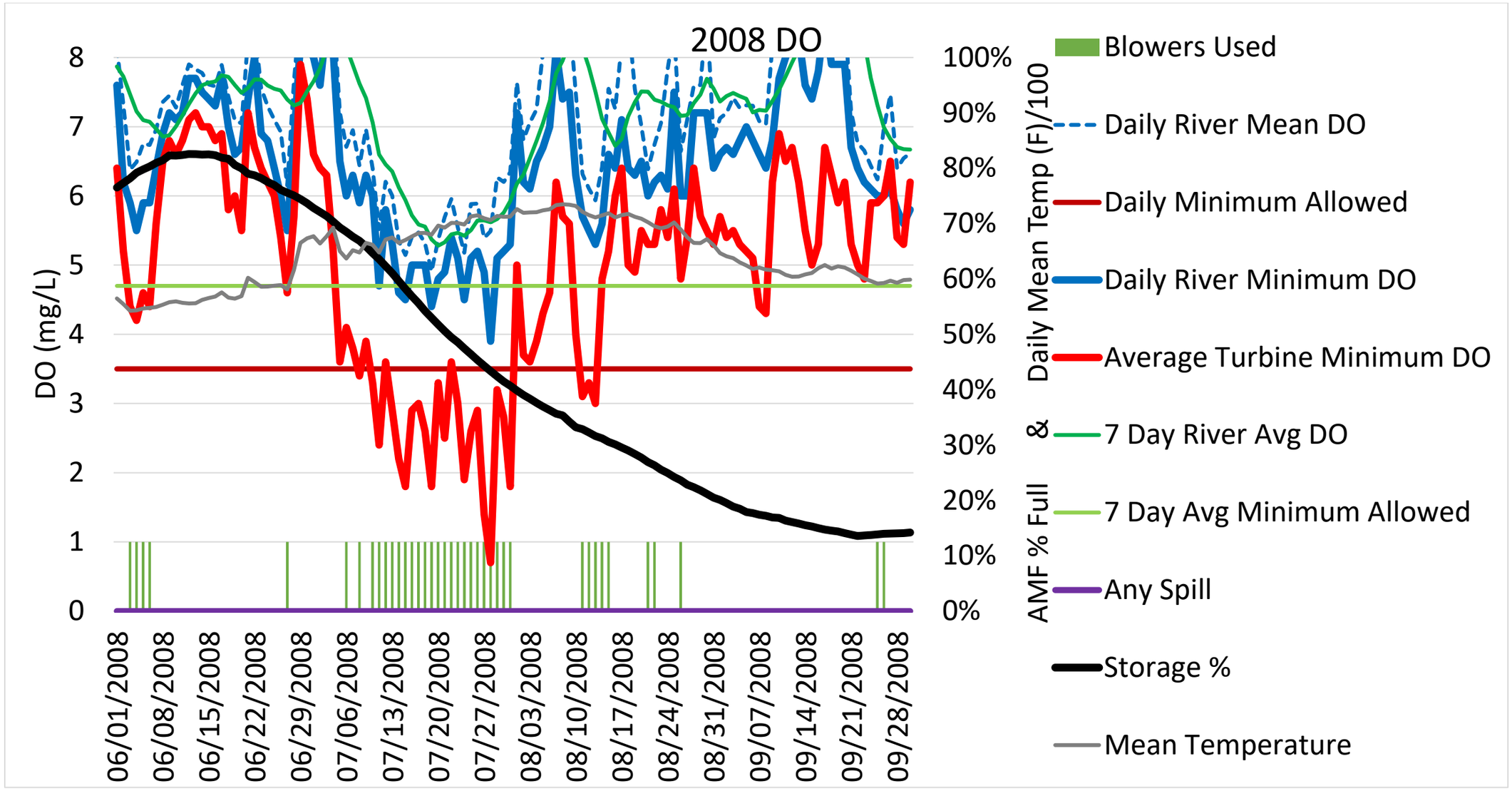
08/12/2007
08/18/2007
08/24/2007
08/30/2007
09/05/2007
09/11/2007
09/17/2007
09/23/2007
09/29/2007
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature


2008 DO
DO (mg/L)
Daily Mean Temp (F)/100 & AMF % Full
0
1
2
3
4
5
6
7
8
0%
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20%
30%
40%
50%
60%
70%
80%
90%
100%
06/01/2008
06/08/2008
06/15/2008
06/22/2008
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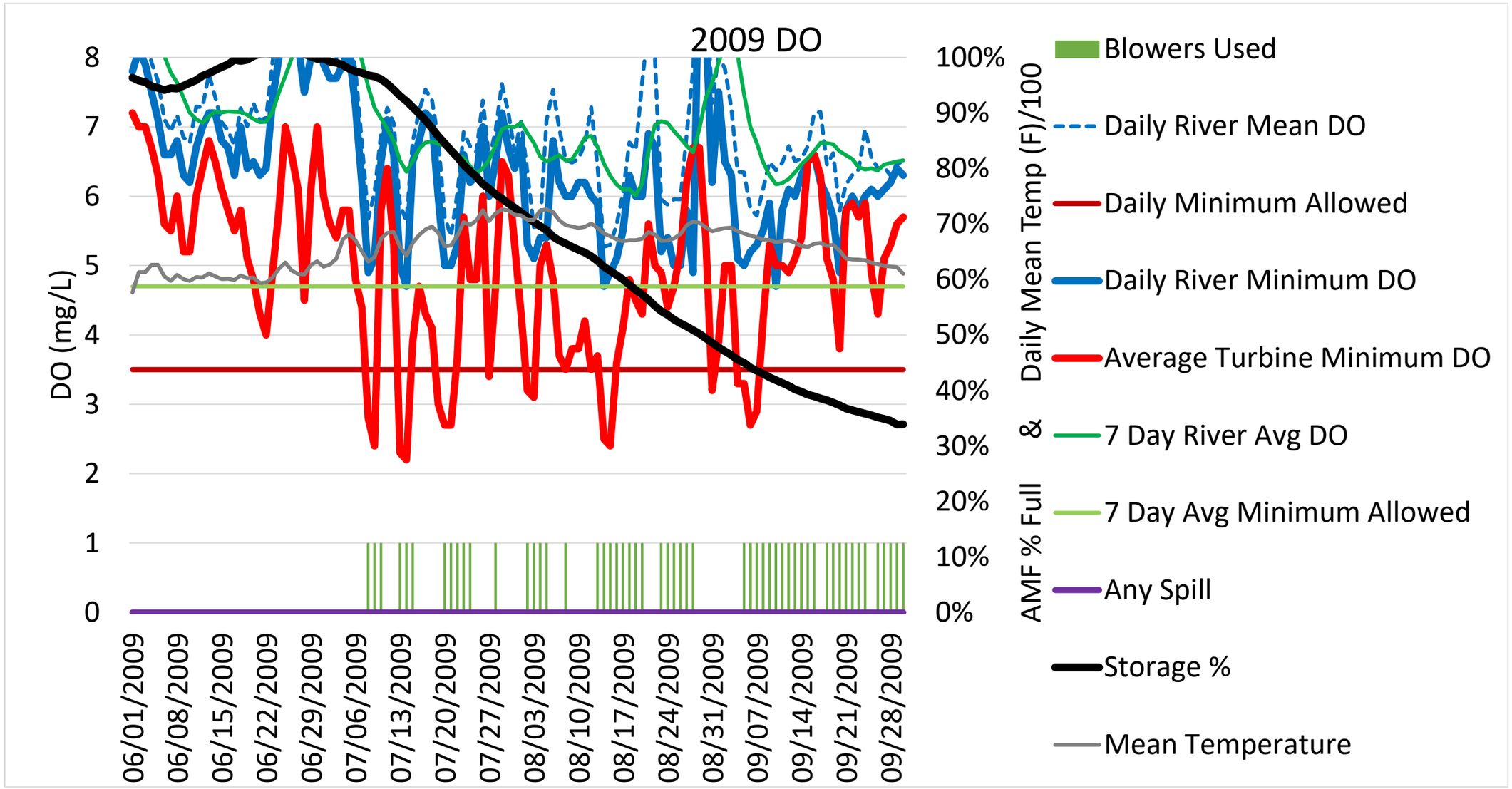
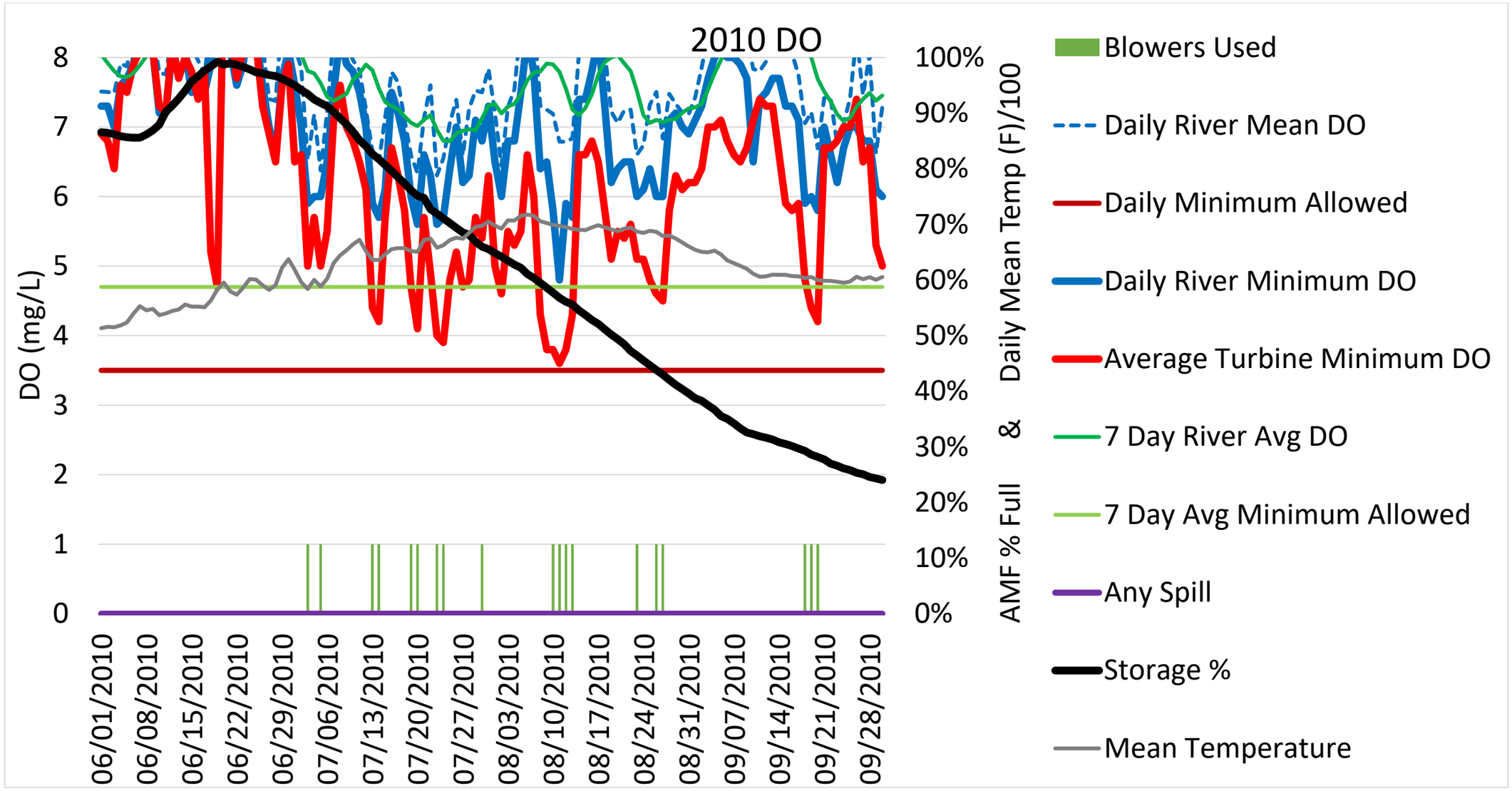
07/06/2008
07/13/2008
07/20/2008
07/27/2008
08/03/2008
08/10/2008
08/17/2008
08/24/2008
08/31/2008
09/07/2008
09/14/2008
09/21/2008
09/28/2008
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature


2009 DO
DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
0
1
2
3
4
5
6
7
8
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
06/01/2009
06/08/2009
06/15/2009
06/22/2009
06/29/2009
07/06/2009
07/13/2009
07/20/2009
07/27/2009
08/03/2009
08/10/2009
08/17/2009
08/24/2009
08/31/2009
09/07/2009
09/14/2009
09/21/2009
09/28/2009
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
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08/10/2010
08/17/2010
08/24/2010
08/31/2010
09/07/2010
09/14/2010
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Blowers Used
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Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
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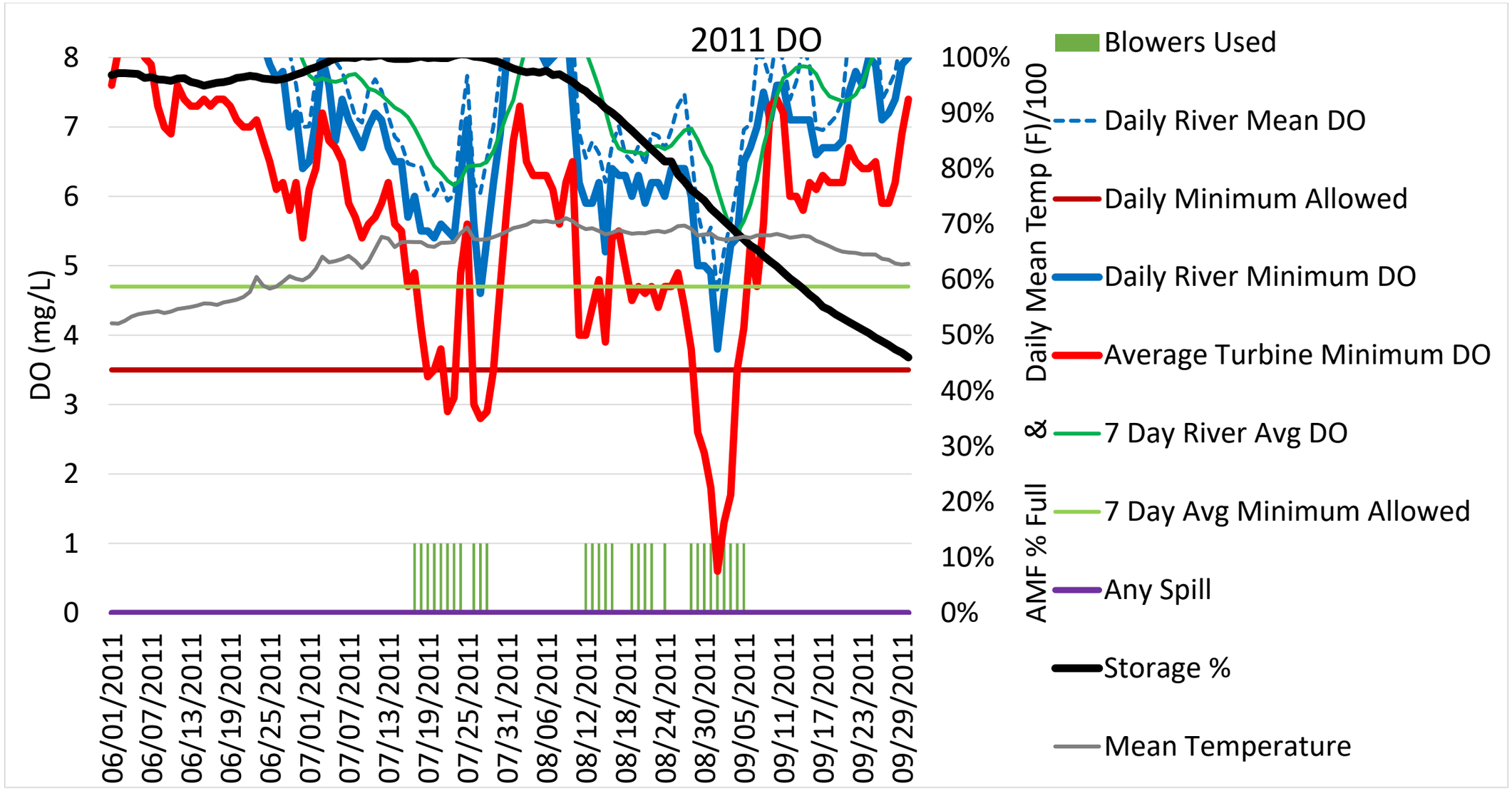
Mean Temperature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Blowers Used
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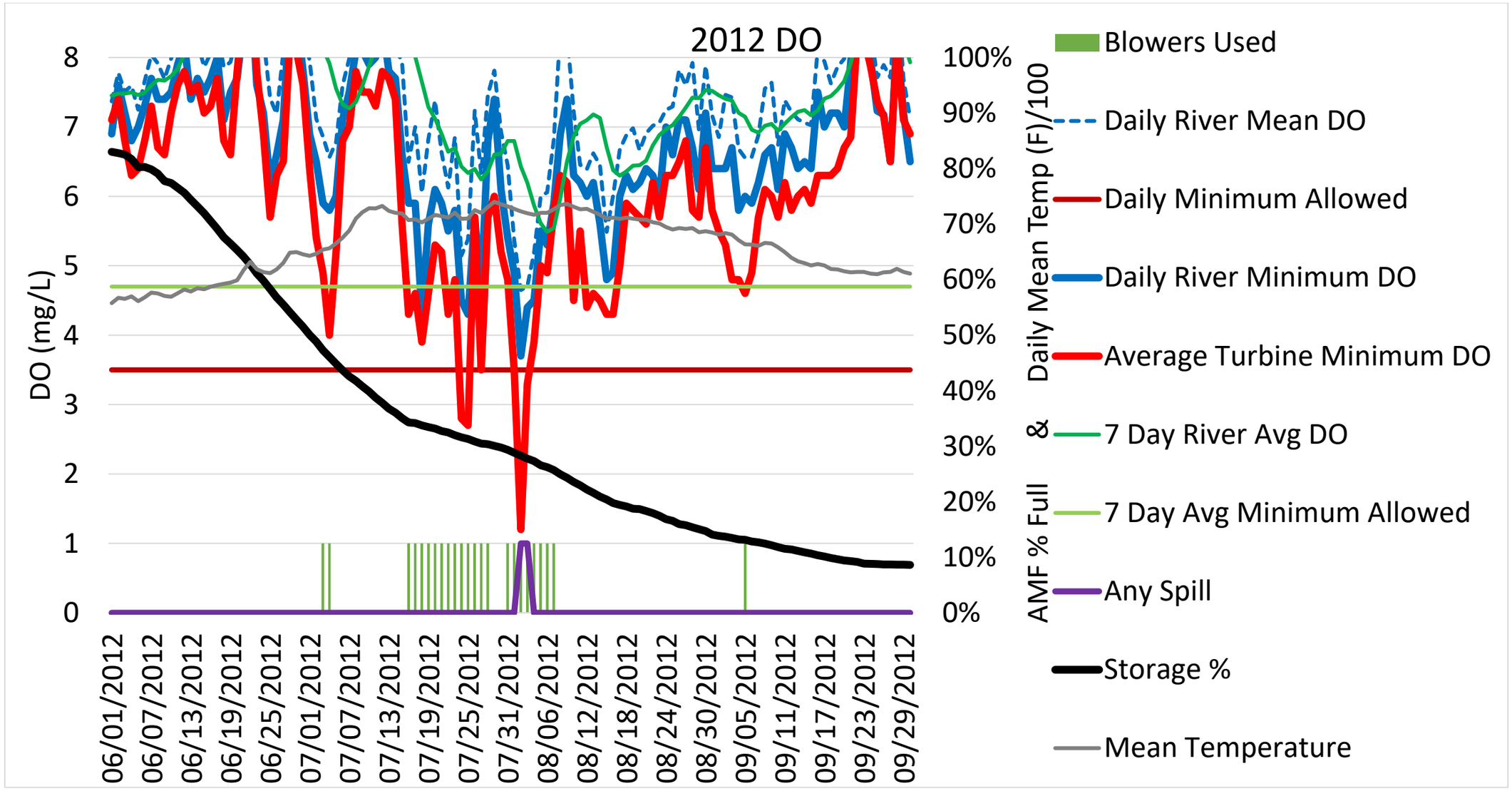
Any Spill
Storage %
Mean Temperature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Blowers Used
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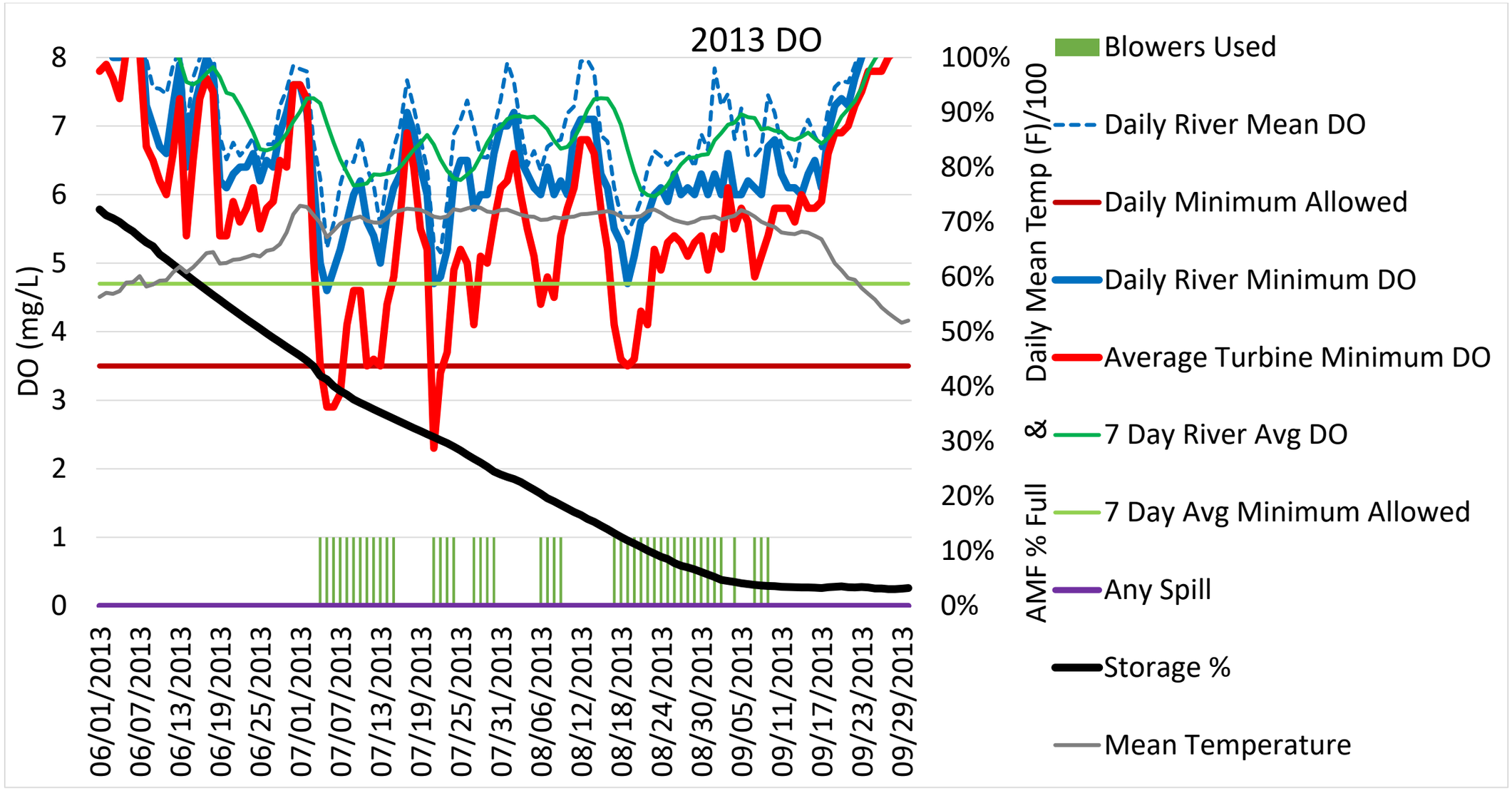
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Blowers Used
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Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
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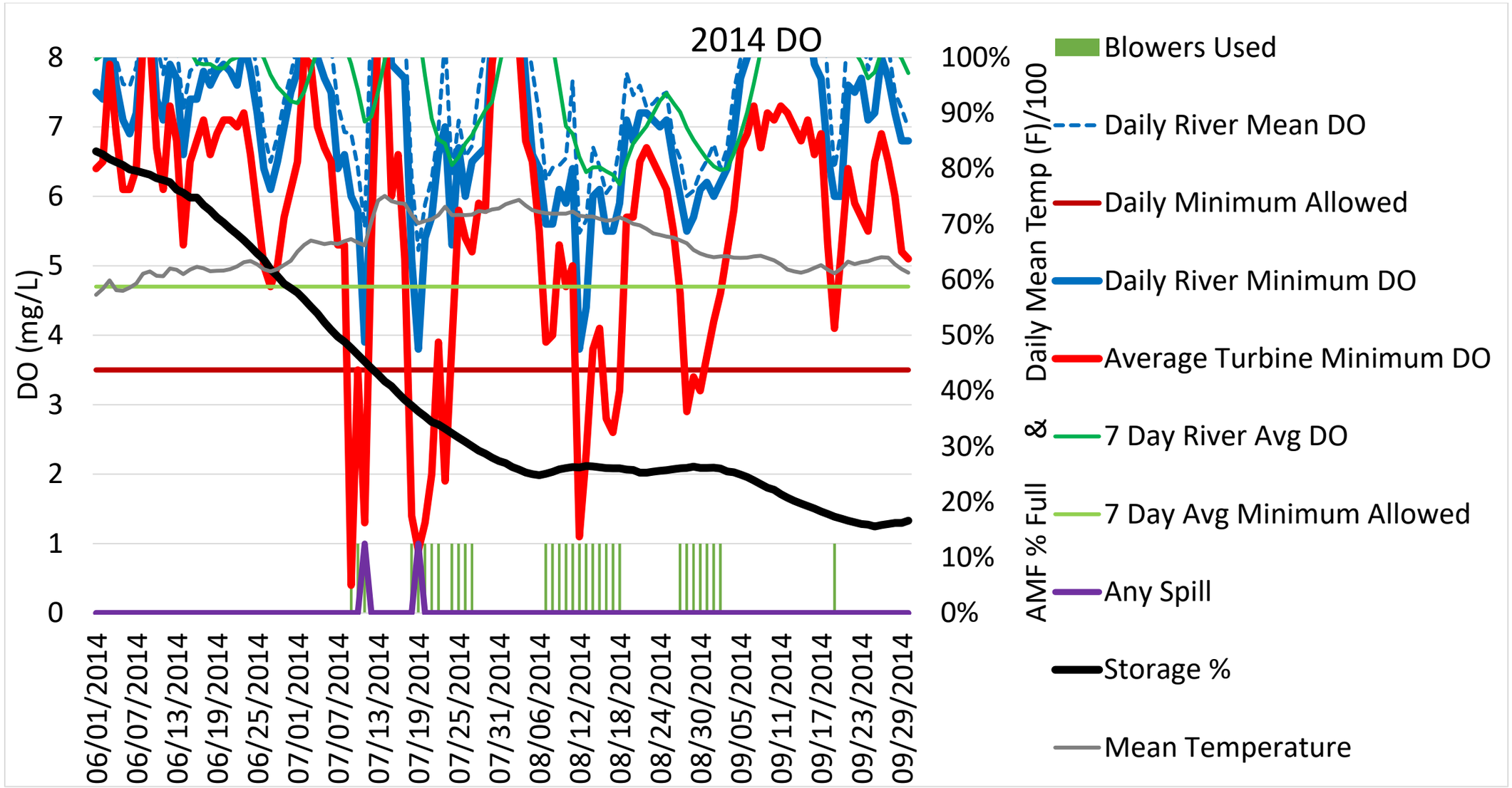
Any Spill
Storage %
Mean Temperature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AMF % Full & Daily Mean Temp (F)/100
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Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
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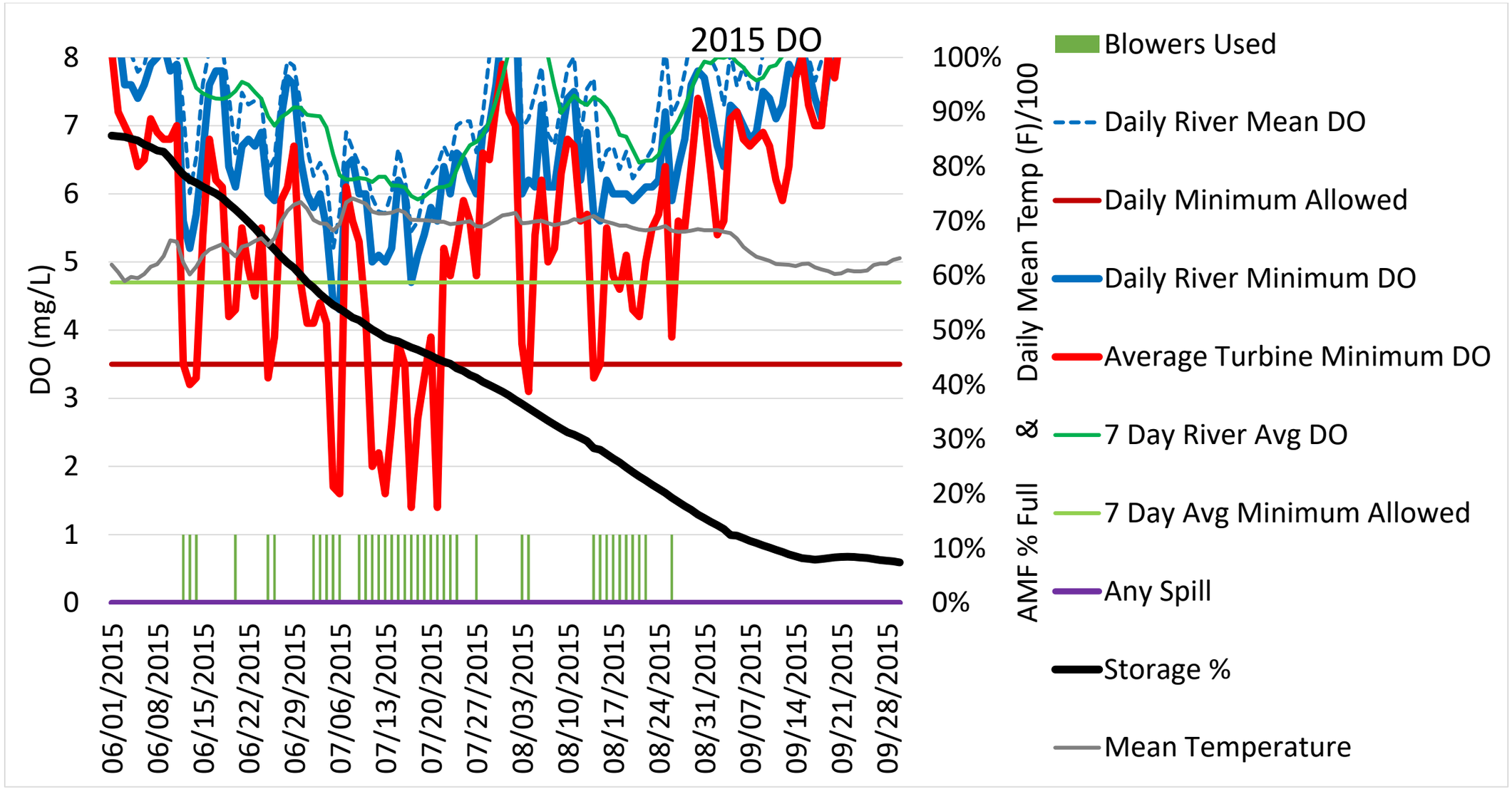
Any Spill
Storage %
Mean Temperature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Blowers Used
Daily River Mean DO
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7 Day River Avg DO
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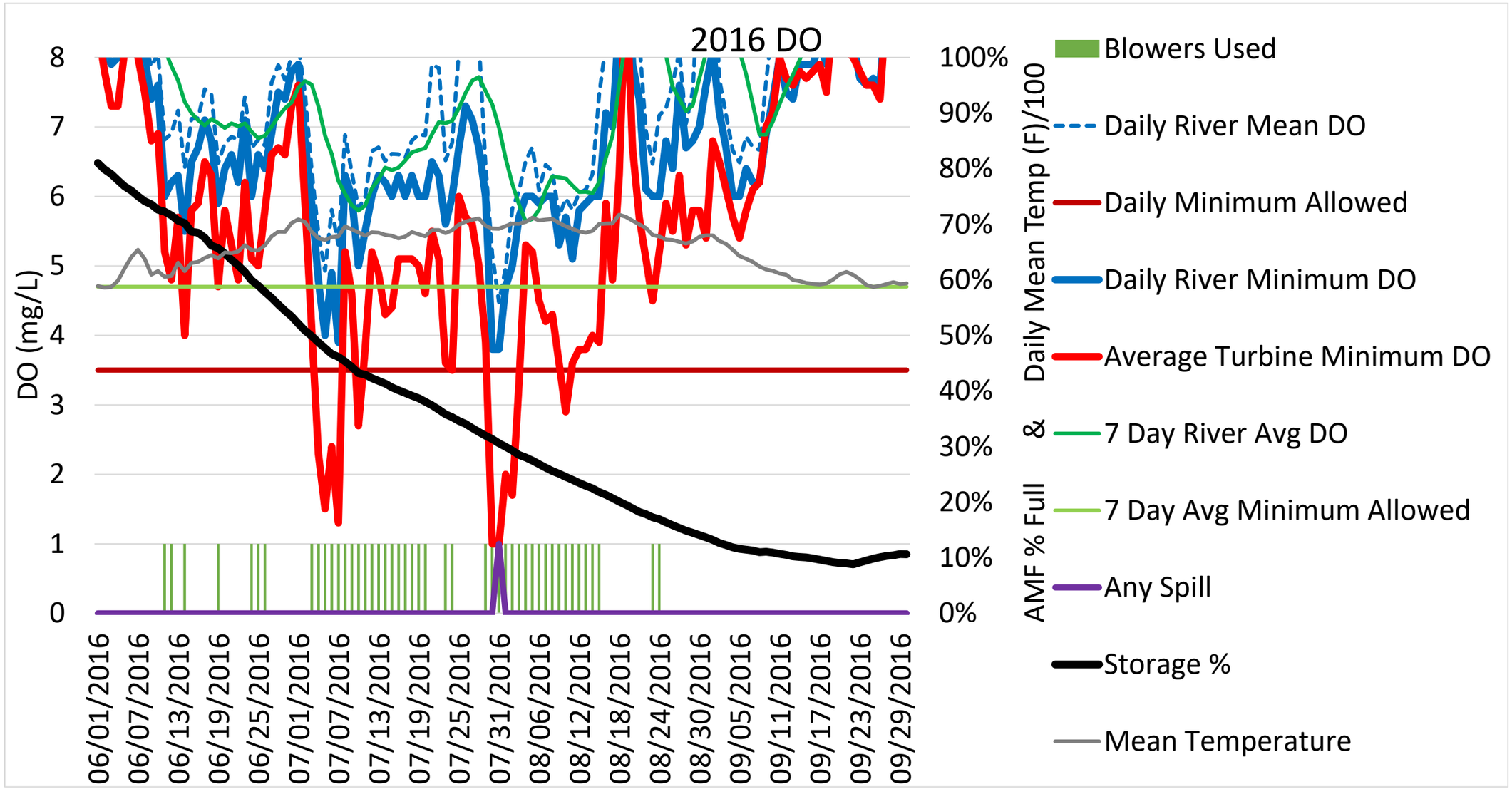
Any Spill
Storage %
Mean Temperature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DO (mg/L)
Daily Mean Temp (F)/100 & AMF % Full
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06/01/2016
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07/01/2016
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07/13/2016
07/19/2016
07/25/2016
07/31/2016
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08/12/2016
08/18/2016
08/24/2016
08/30/2016
09/05/2016
09/11/2016
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Blowers Used
Daily River Mean DO
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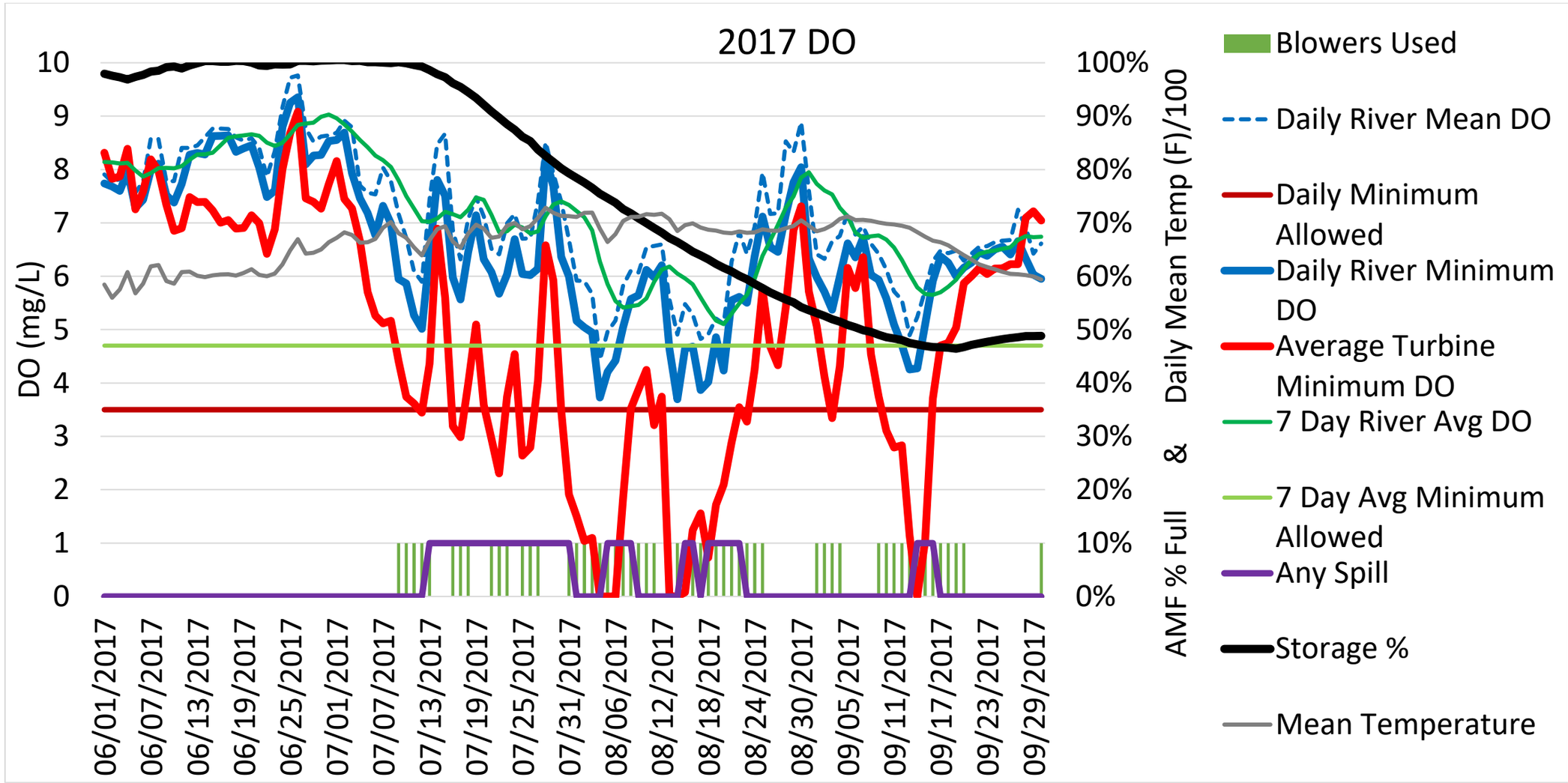
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
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08/18/2017
08/24/2017
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09/05/2017
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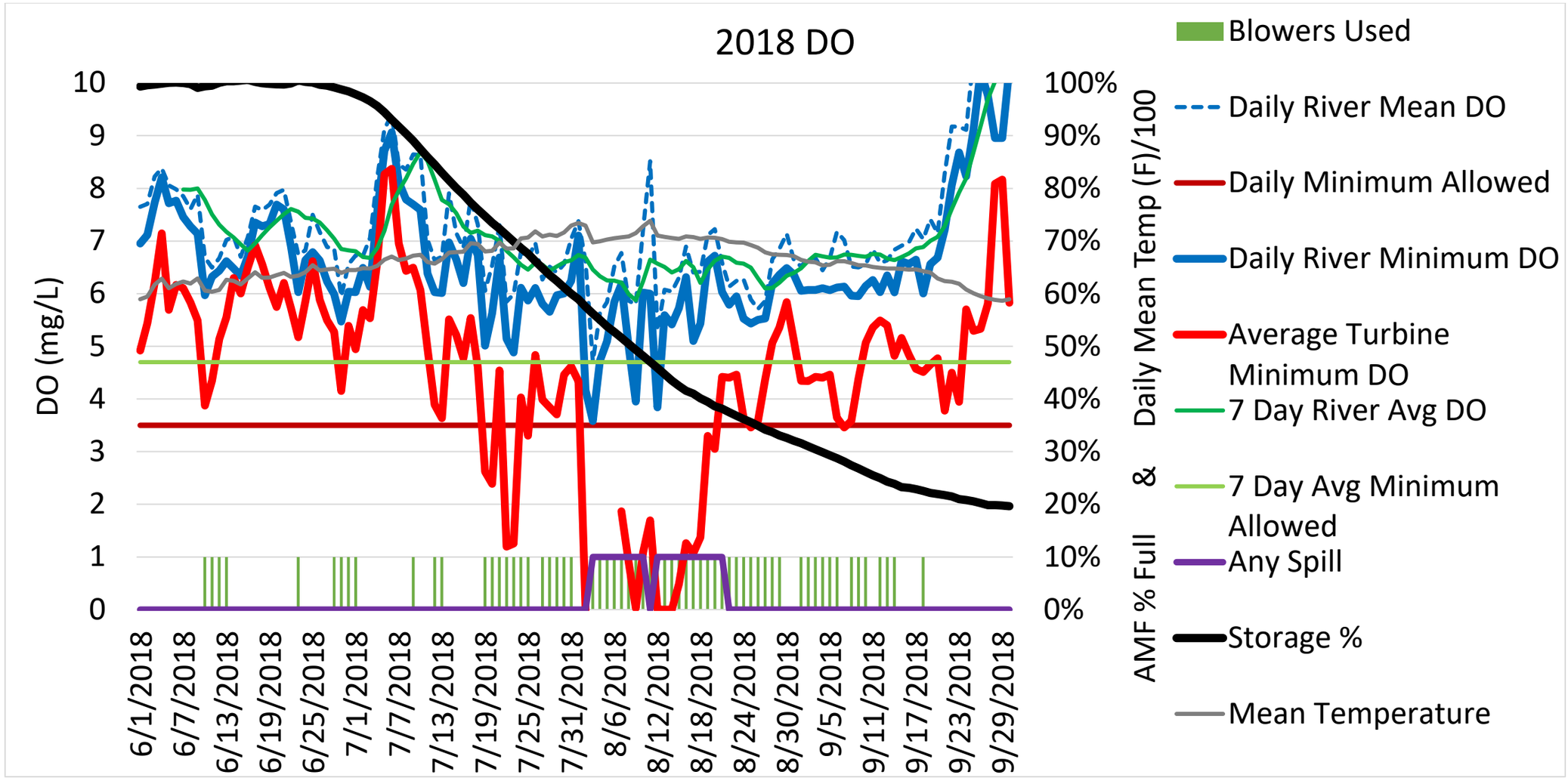
09/17/2017
09/23/2017
09/29/2017
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
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7/7/2018
7/13/2018
7/19/2018
7/25/2018
7/31/2018
8/6/2018
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8/18/2018
8/24/2018
8/30/2018
9/5/2018
9/11/2018
9/17/2018
9/23/2018
9/29/2018
Daily Mean Temp (F)/100 & AMF % Full
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature

APPENDIX D

Water Quality Restoration Plan

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DRAFT Water Quality Restoration Plan
for
Maintenance and Rehabilitation of Spillway and Dam Structures at American Falls Dam Project

Prepared by
U.S. Bureau of Reclamation

Introduction

The Bureau of Reclamation (Reclamation) is proposing to conduct maintenance and rehabilitation construction activities to cut, remove, and replace existing damaged concrete and reinforcing on the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin structures. In addition, the proposed action would include replacement or modification of the existing drain grate at American Falls Dam. This proposed Water Quality Restoration Plan is being developed in conjunction with the National Environmental Policy Act (NEPA) compliance process, and is included as a companion document to the Final Environmental Assessment (EA) for the proposed action. The Final EA fully documents the analysis.

This Water Quality Restoration Plan outlines mitigation actions to be taken to avoid and/or minimize the possibility of low dissolved oxygen (DO) concentrations in the Snake River below American Falls Dam due to the proposed project. This plan is not meant to be all-encompassing. If unforeseen impacts to water quality occur that are out of scope of this plan, additional mitigation may need to be collaboratively developed and implemented.

Project Scope and Purpose

The purpose of the proposed action is to maintain and improve the structural integrity of the spillway and stilling basin structures at American Falls Dam. These efforts will provide a more feasible means of access for future maintenance activities and prevent further deterioration, which could lead to serious structural deficiencies.

The need for action comes from the current cracked and damaged state of concrete on the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin floor structures. These concrete components of the dam structure are exhibiting significant deterioration, cracking, and spalling, and they require repair. Minor repairs have been completed to the spillway face throughout its lifetime, including an overlay of the stilling basin floor that was completed in 1978 to repair damaged concrete after the initial spill season. However, over the ensuing 40 years of service these structures have undergone ongoing deterioration. A Value Engineering Study was completed in September 2015, which recommended the following corrective actions: removal and replacement of 6 inches of

concrete on the spillway face and stilling basin floor; repair of concrete on the upper spillway gate operator decks (referred to as “pier decks” in these recommendations); and complete replacement of the spillway adits (access entryways).

Reclamation proposes to perform construction activities necessary for the maintenance and rehabilitation of the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin floor structures at American Falls Dam. The project consists of the cutting, removal, and replacement of existing damaged concrete and reinforcing, and replacement or modification of an existing drain grate. This project would address the need for the replacement and repair of concrete on these dam structure components which has cracked, spalled, and otherwise deteriorated over 40 years in service. These components require repair before further deterioration compromises the integrity of the dam.

The major construction components of the proposed action are:

- **Stilling basin floor concrete removal/repair**: A 4-inch thick epoxy bonded overlay plus an additional 2 inches of original concrete below the overlay would be removed. The removed concrete would be replaced with a 6-inch overlay and single mat of reinforcing doweled into the existing concrete.

- **Spillway face concrete removal/repair**: Approximately 6 inches of concrete on the spillway face would be removed to expose sound concrete. The removed concrete would be replaced with a 6-inch lift of replacement concrete.

- **Gallery adit replacement**: The adits located on the east and west sides of the spillway would be removed and replaced. It is anticipated this will require complete removal and replacement of the adit concrete from the downstream face of the dam outward.

- **Spillway gate operator deck (pier deck) repair**: Repair of deteriorated concrete on the edges of all spillway gate operator decks would be performed.

- **Downstream dam face concrete repair**: Localized repair of cracked and damaged concrete on both the left and right downstream faces of the dam would be performed.

- **Drain grate replacement**: The existing drain grate would be removed and replaced or modified to provide a removable section to facilitate future access for maintenance.

Specific construction methods used to accomplish each of these tasks will be proposed by the contract awardee and subject to approval by Reclamation. Compliance with industry best practices would be required of the contract awardee.

This work would occur in two separate years within a proposed seasonal construction window of May 1 to November 23 in both 2020 and 2021. The portions of the proposed construction work taking place within the waterway would require a lockout and complete dewatering of the spillway and stilling basin, during which time all flows would instead have to pass through the powerplant. This in-waterway work would begin on or after August 1 and cease

by November 23 in both 2020 and 2021. For the 2 years this project would occur, an agreement between Reclamation and Idaho Power would provide for the continued passage of flows through the powerplant throughout this late season timeframe, which would enable uninterrupted water deliveries. Reclamation would in turn agree to provide 1,000 cfs of water (an increase from typical winter flows) from October 16 to November 23, which would enable Idaho Power to continue minimal generation rather than passing water at "speed no load" for an extended timeframe. Work would occur in the waterway for an estimated maximum of 152 days within the 2 year duration of this project and all water would pass through the Idaho Power powerplant during this timeframe.

During work in the waterway, westbound State Highway (SH) -39 (Aberdeen Highway) where it crosses the dam would be closed, and all traffic rerouted to eastbound SH-39 under coordination with the Idaho Transportation Department (ITD). Also, there would be periodic scheduled closures for the passage of oversized vehicles to accommodate the seasonal agricultural needs of the region. These traffic control restrictions would be in place for an estimated 113 to 130 days within the 2 year duration of this project.

Background

The Minidoka Project was authorized by the Secretary of the Interior in 1904 and was the first Reclamation project constructed in Idaho. The Project was constructed in the Snake River Basin in the southeastern part of the state. American Falls Dam is a 94-foot-high composite concrete and earth gravity-type dam on river mile 714.7 of the Snake River near American Falls, Idaho. American Falls Reservoir is the largest reservoir of the Project. In 1927, Project storage was increased by 1,700,000 acre-feet with the completion of the dam. The dam itself is located in Power County, Idaho, but the reservoir stretches northeast into both Bingham and Bannock counties. American Falls Dam and Reservoir comprise a multipurpose facility that creates principle benefits including irrigation, power generation (through a powerplant owned and operated by Idaho Power), flood control, fish and wildlife resources, and recreation (Reclamation 1995).

A core-drilling program in the early 1960s revealed that the concrete in portions of the dam was in a relatively advanced stage of deterioration due to a chemical reaction between alkalis in the cement and the aggregate. This type of reaction, unknown at the time of construction, resulted in a significant loss in strength and durability. The reaction threatened the competence of the dam and reduced the storage capacity of the reservoir to about 66 percent of its maximum design capacity. By congressional act of December 28, 1973, the American Falls Reservoir District, acting as the constructing agency representing the storage spaceholders, was authorized to finance and contract for the replacement of American Falls Dam. The replacement was completed in 1978 and the original structure was demolished. Reclamation repaid the District, acquired title, and assumed responsibility for operations and maintenance after completion of the dam.

In 1976, Idaho Power built the current dam's hydroelectric powerplant, which consists of three generators that are authorized by the Federal Energy Regulatory Commission (FERC) to

produce 92.4 megawatts of hydroelectricity (FERC 2018). Idaho Power generates hydroelectricity at this powerplant at American Falls Dam when sufficient head conditions allow, generally from the end of March through mid-October.

American Falls Reservoir and associated Reclamation-administered lands are operated to accommodate a wide variety of resource needs in accordance with existing Federal laws and Reclamation policy. However, the primary operation strategy is storage of water for irrigation of lands. Cooperative agreements have been signed with other agencies and organizations for programs focused on control of erosion and enhancement of wetlands and other wildlife habitat. Local jurisdictions and organizations have leased Reclamation lands to develop and operate recreational facilities. Project operations are monitored and evaluated to provide resource management that provides the greatest benefit within statutory and policy guidelines (Reclamation 1995).

American Falls Dam Water Release Configurations

Water released from American Falls Dam flows into the Snake River via two routes (or a combination)—through penstocks that pass through the dam structure and feed into the powerplant owned by Idaho Power, which then discharges it directly into the river channel; or through lower regulating gates on the dam that discharge into the stilling basin, which then overflows into the river channel once it is filled.

The powerplant at American Falls Dam is capable of passing a maximum of 15,000 cubic feet per second (cfs) and hydropower generation is possible when flows through the powerplant are at least 1,000 cfs. Idaho Power halts hydropower production when flows drop below the 1,000 cfs needed for power generation at the end of irrigation season (typically on or around October 15th). Although it is possible for the powerplant to pass water at "speed no load[1]" (without generating power), standard dam operations are to cease all releases through the powerplant at the end of the irrigation season and all water is then passed through the stilling basin until power generation resumes in the spring.

Water passing through the stilling basin may come through the upper radial gates, or through lower regulating gates on the dam structure, but is all broadly referred to as "spill." Regardless of which gates are used, in order for spilled water to reach the river channel downstream, the stilling basin must first fill completely. Because the maximum powerplant discharge is 15,000 cfs, passage of flows above 15,000 cfs requires the use of spill. Flows from either of the two routes (powerplant or spill) converge together approximately 1,000 feet downstream from the dam.

[1] "Speed no load," also referred to as "full speed no load" or FSNL, is a power generation configuration where one or more turbines are in operation (spinning), but no power generation load is applied. In hydrogeneration, speed no load operation generally occurs at startup, or at times when power demand is low but continued water passage is desired. Due to the potential for equipment damage, it is generally undesirable to maintain a speed no load configuration for an extended timeframe.

Water Operations Considerations

Under normal operations, water releases at American Falls Dam generally adhere to the following operational guidelines[2]:

Irrigation season (April through September): Irrigation releases are determined by the diversion demands at Minidoka and Milner Dams. All flows are passed through the powerplant except in the rare events that the powerplant is offline, the capacities of the powerplant and outlet works are exceeded, or low dissolved oxygen downstream from the dam necessitates the use of spill. River changes are formally called in to Idaho Power and the powerplant operator makes the required changes. Normal flows are 12,000 to 13,000 cfs and are typically adjusted through the irrigation season to maintain Lake Walcott (above Minidoka Dam) at a constant elevation of 4,245 feet. In the late irrigation season, drawdown of Lake Walcott in preparation for winter can also be used to meet some downstream irrigation demand.

Winter (October through March): The Idaho Power powerplant requires a minimum flow of 1,000 cfs to generate power and so typically stops power generation mid-October at the time when releases from the dam are reduced to winter flows. All flows are then passed through the regulating gates on the dam and into the stilling basin, which overflows into the Snake River downstream from the dam once it is filled. There is no official minimum winter release, but an unofficial minimum release of 300 cfs in the non-irrigation season is generally targeted in consideration of benefits to fish and wildlife. Idaho Department of Fish and Game (IDFG) prefers that Reclamation maintain post-irrigation fall releases above 2,000 cfs until November 1st to prevent over-harvest of fish in the reach downstream from American Falls. In years when releases during this timeframe must be reduced to 1,000 cfs or less, IDFG may close fishing in this reach. Higher spring flows are passed as needed for flood control with a target reservoir refill date of April 1. All flows are passed as spill until the powerplant resumes power generation in the spring, typically in March.

Past Water Quality Impacts

Dissolved Oxygen

The 2012 American Falls Subbasin Total Maximum Daily Load (TMDL) Plan: Subbasin Assessment and Loading Analysis identified that American Falls Reservoir can have low DO concentrations. The low DO concentrations may be attributed to the algae population collapse that tends to occur in the late summer. The report speculates that cloud cover or late summer rainstorms reduce the available sunlight and that phytoplankton respire more, consuming oxygen rather than photosynthesizing, which decreases the reservoir DO concentrations. In

[2] Formal flood control rule curves have not been developed for American Falls Reservoir; therefore, there is no formally designated amount of minimum space that must be maintained for flood control. However, American Falls is generally operated with the goal of limiting discharge from Minidoka Dam to less than 20,000 cfs.

the late summer, the reservoir could pass water with low DO concentrations through the dam directly into the Snake River.

Idaho Power monitors DO concentration and water temperature per their FERC hydropower license. Per IDA 2019, from May 15 to October 15 minimum DO concentration standards to be met below American Falls Dam are as follows:

- 30 day mean of 5.5 mg/L;
- 7 day mean minimum of 4.7 mg/L; and
- Instantaneous minimum of 3.5 mg/L.

Idaho Power uses up to two aerators just downstream from the dam to infuse oxygen into the river water to meet or exceed the minimum DO concentration standards. If DO concentration minimums cannot be met, Idaho Power passes water through American Falls Dam as spill, increasing DO concentrations through turbulent, aerated water. There have been isolated instances where DO concentrations could not be increased to levels in compliance with minimum DO standards below American Falls Dam. This occurred most recently in late summer of 2018 and was likely caused by the combination of algae population collapse and a series of overcast days, by high winds pushing low oxygenated water in the dam intake (Grossarth 2018), or a combination of these conditions.

Sediment

Sediment and siltation can become an issue at American Falls Reservoir. During drought and low water years, American Falls Reservoir can be drawn down to low levels to meet water delivery demands. This draw down can create natural channels through the reservoir bottom sediment causing the water to become sediment-laden and murky before passing through the dam. The entrained sediment is discharged into the Snake River and can cause instream total suspended solids (TSS) and turbidity to increase, which may impact recreational fishing and boating and the cold water aquatic life beneficial use. Idaho Departement of Environmental Quality (IDEQ) documented these occurrences in the 2012 Lake Walcott Subbasin Assessment and Total Maximum Daily Loads Five Year Review document. IDEQ stated, “This situation occurred during a 45-day period from August 31–October 14, 2007, during which the BOR’s [Reclamation’s] management actions caused the water in American Falls Reservoir and the Snake River downstream to have elevated sediment and turbidity levels such that water quality violations and a fish kill occurred. In 1994 and 2001, similar water quality violations occurred due to similar BOR [Reclamation] management actions. However, this most recent event occurred for a much longer duration than in past years” (IDEQ 2012).

In 2010, IDEQ and Reclamation finalized and implemented a Water Quality Management Action Plan for American Falls Reservoir and the Snake River below American Falls Dam during periods of drought or low flow. Reclamation would target a minimum content of 100,000 acre-feet in American Falls Reservoir from the beginning of the storage delivery season to avoid increased sediment discharged below the dam. This and shoreline protection measures would decrease sediment discharged below the dam. However, in some years if hydrologic conditions (typically drought) and irrigation demand on reservoir storage preclude

retaining the target volume of 100,000 acre-feet, discharges below American Falls may not be in compliance with TSS targets and the Snake River below the dam would be affected. Effects from the excess sediment would be similar to those identified by IDEQ in the 2012 Lake Walcott Subbasin Assessment and Total Maximum Daily Loads Five Year Review document.

Potential Impacts from Construction Actions

Construction activity is expected to have only minimal short-term water quality effects. Of greatest concern is the release of low DO water from the reservoir into the Snake River below the dam if the use of both of Idaho Power's aerators cannot raise DO concentrations to compliance during construction when water cannot be passed as spill.

Attachment 1 shows the daily average DO concentrations at the dam penstocks and in the Snake River just below the dam, water temperature in relation to reservoir storage (percent of full volume), and the dates when aerators (blowers) and/or spill were used in order to bring low DO concentrations up to compliance minimums below the dam. This data is shown for the period of June through September from 2002 through 2018. Most instances of low DO concentrations occur in July and August with very few occurrences in the first half of September. Data in Attachment 1 can be separated into three groupings (A, B, and C) based on when and how often spill was used to raise low DO concentration below the dam as follows:

- Group A: in years 2003, 2006, 2014, and 2016 spill was necessary over a few, discrete days to meet state DO concentration standards.
- Group B: in 2002, 2005, 2004, 2007 through 2011, 2013, and 2015, Idaho Power's aerators alone were able to raise DO concentrations to meet state DO concentration standards.
- Group C: low DO occurrences in 2017 and 2018 required spill for a much longer duration (compared to group A) to mitigate for the low DO concentrations.

Mitigation

This Water Quality Restoration Plan covers mitigation actions taken to avoid and minimize low DO concentrations in the Snake River below American Falls Dam. Reclamation engaged with IDEQ and IDFG in 2018 and discussed the potential impacts and possible mitigation measures for the proposed project. Reclamation also engaged with Idaho Power in 2018 and discussed how Idaho Power manages flows for power production and facility limitations. Before the proposed in-waterway construction begins in 2020, Reclamation and Idaho Power will have a Memorandum of Agreement (MOA) in place defining specific roles and responsibilities associated with water operations and water quality monitoring and restoration during the American Falls Spillway Concrete Repair project.

After the in-waterway construction period in 2020, Reclamation, in coordination with IDEQ, IDFG, and Idaho Power, will assess mitigation measures and evaluate adjusting mitigation

measures for the 2021 construction period, if necessary. Water quality in American Falls Reservoir near the dam and in the Snake River below the dam will be closely monitored before and during project implementation to provide metrics for predicting lowering DO concentrations, or other water quality issues that may arise.

Goal and Objectives

The goal of this Water Quality Restoration Plan is to ensure the proposed project does not contribute to violations of Idaho State water quality standards. Objectives include:

1. Avoid and minimize low DO concentrations in the Snake River below American Falls Dam during project construction.
2. Monitor water quality above and below American Falls Dam before and during construction to ensure compliance with Idaho State water quality standards.

Work Plan

The Snake River below American Falls Reservoir is a popular fishery and recreation area. During the in-waterway construction period (August 1 through November 23) of 2020 and 2021, the use of spill will not be readily available to supplement Idaho Power's two aerators to raise DO concentrations below the dam. This operational limitation, in light of the recent fish kill that occurred below American Falls Dam due to low DO concentrations, makes DO mitigation below the dam a primary concern for Reclamation's proposed construction.

Reclamation collaborated with IDEQ and IDFG to define a path forward to minimize water quality effects. Reclamation also collaborated with Idaho Power on technical attributes of power generation operations at American Falls. Reclamation will sign a MOA with Idaho Power defining specific roles and responsibilities associated with water operations and water quality monitoring and restoration during the American Falls Spillway Concrete Repair project.

A Water Quality Action Team will be formed to advise Reclamation's Upper Snake Field Office (USFO) management of the potential need for emergency use of spill during construction. This team would be comprised of USFO, Reclamation Snake River Area Office (SRAO), Idaho Power, IDEQ, and IDFG technical personnel. Team members would evaluate environmental conditions, assess agency needs, and make recommendations to USFO management related to spill, and they would identify potential impacts from its use. Team members would need to be available for immediate communications during critical times in the in-waterway construction period (August 1 through September 15).

IDEQ personnel will monitor reservoir water quality parameters before and during construction, and as needed to predict downward trends in DO concentrations and possible total dissolved gas (TDG) issues if/when additional aerators are used. Reclamation will be in regular communications with IDEQ to facilitate adjustment of mitigation approaches as needed to meet changing environmental conditions.

Reservoir Operations

The primary method of mitigating potentially low DO concentrations in the Snake River below American Falls Dam is to operate American Falls Reservoir at seasonal elevations similar to those which in the past have not produced low DO concentrations, or have produced marginally low DO concentrations that could be quickly brought into compliance with state DO standards through use of one or both of Idaho Power's aerators. Years when this been accomplished include 2002, 2004, 2005, 2007 through 2011, 2013 and 2015.

All flows would have to be passed through the powerplant for approximately six additional weeks after the powerplant would typically shut down. From 1981 to 2010, the daily average discharge from American Falls Dam during the late October to late November timeframe was approximately 540 cfs. To mitigate the potential for damage to equipment that passing water at speed no load for an extended period could create, Reclamation would agree to provide a minimum of 1,000 cfs of flow throughout the in-waterway construction period to enable minimal power generation by the turbine unit that would be passing the flow. This would be a flow increase of approximately 460 cfs, sustained for approximately 6 weeks from October 15th until November 23rd, in each of the two construction years. Over this 6 week period, the additional water released and moved from American Falls Reservoir into Lake Walcott would total approximately 38,000 acre-feet, which corresponds to an approximate 1 foot water level change in American Falls Reservoir.

To preserve the overall management approach of the upper Snake River watershed and not "lose" this additional water, the extra flow that would be released during the 6 week period starting October 15th would be captured in the next downstream reservoir, Lake Walcott, which is regulated by Minidoka Dam. To enable this, beginning in September and ending by October 15th a temporary storage deficit of approximately 38,000 acre-feet of storage in Lake Walcott would be created by reducing releases from American Falls Dam to levels below the irrigation demand downstream of American Falls Dam. This will allow Lake Walcott to draft approximately 38,000 acre-feet lower than it normally would during the September and October time frame.

The 38,000 acre-feet temporary storage deficit in Lake Walcott corresponds to a decrease in pool level of approximately 4 feet below the normal pool level of 4,245 feet. This decrease in pool level would begin in early September, and reach the maximum drawdown point in mid-October. The target drawdown pool elevation would be 4,241 feet by October 15th in 2020 and 2021. If local inflows into Lake Walcott are exceptionally high in the years during construction, a drawdown level of 4,240 feet may be needed to enable recapture of the increased releases from American Falls Reservoir during the time from October 15th to late November.

Under this management scenario, by the mid-October timeframe, storage content in Lake Walcott would be reduced to between 40,000 and 57,200 acre-feet. Recapture of the additional discharge from American Falls during the October to November construction period would then refill Lake Walcott, which would be approximately full by the end of the

work window. After that time, discharge from American Falls Dam would be reduced to typical winter flows of 540 cfs or less.

Additional Aerators

If low DO concentrations in the Snake River below American Falls Dam cannot be raised by reservoir operations and/or use of both of Idaho Power's aerators, up to three portable aerators placed immediately below the dam would be used (in conjunction with the two Idaho Power aerators) to raise DO concentrations to compliance with state standards. The portable aerators to be used are comprised of a diesel air compressor on a trailer, with a hose attachment and an air-sending unit placed in the bottom of the waterbody which forces "bubbles" of ambient air through the water column. Each portable aerator has a fee-air delivery of 750 cubic-feet/minute (cfm) with an operating pressure of 150 pounds/square inch (psi). Increases in DO concentration from three portable aerators of this capacity/configuration are expected to be similar to or exceed DO increase from Idaho Power's two aerators. Specific aerator (compressor and air-sending unit) placement for efficiency and security will be investigated in summer 2019. Aerator use will be based on monitoring data and recommendations from IDEQ.

Limitations to portable aerators include a decrease in efficiency when air temperatures are above 92° F, and the potential to increase TDG above state water quality standards (110 percent) below the dam.

Emergency Spill

If DO concentrations that do not meet state standards persist despite implementation of the previously discussed mitigative measures, the Water Quality Action Team (composed of USFO, SRAO, Idaho Power, IDEQ, and IDFG personnel) would advise USFO management if they believe emergency discharge of spill is warranted. If deemed necessary, USFO management could discharge spill (upon a 48 hour notice) to increase DO concentrations below the dam. This action would have potentially serious effects on spillway construction.

Exemption

Reclamation applied for an IDEQ Short-Term Activity Exemption, identified in the Idaho State Water Quality Standards section 080.02.b.vi: Maintenance of existing structures (IDA 2019) for construction periods August 1 through November 26 of 2020 and 2021. If/when granted, this would ensure compliance with state water quality standards for DO concentration and TDG saturation by exempting construction activities that may affect DO and TDG concentrations below the dam for a short time period.

Performance Standards

Performance standards are as follows:

1. Before construction activities begin, signature of a MOA between Reclamation and Idaho Power that will define specific roles and responsibilities associated with water

operations, water quality monitoring, and mitigative measures to be implemented during the American Falls Spillway Concrete Repair project.

2. Establishment of a Water Quality Action Team and a Communications Plan.
3. Implementation of water quality monitoring and communications between IDEQ and Reclamation.
4. Adherence to the methods described in this Water Quality Restoration Plan.

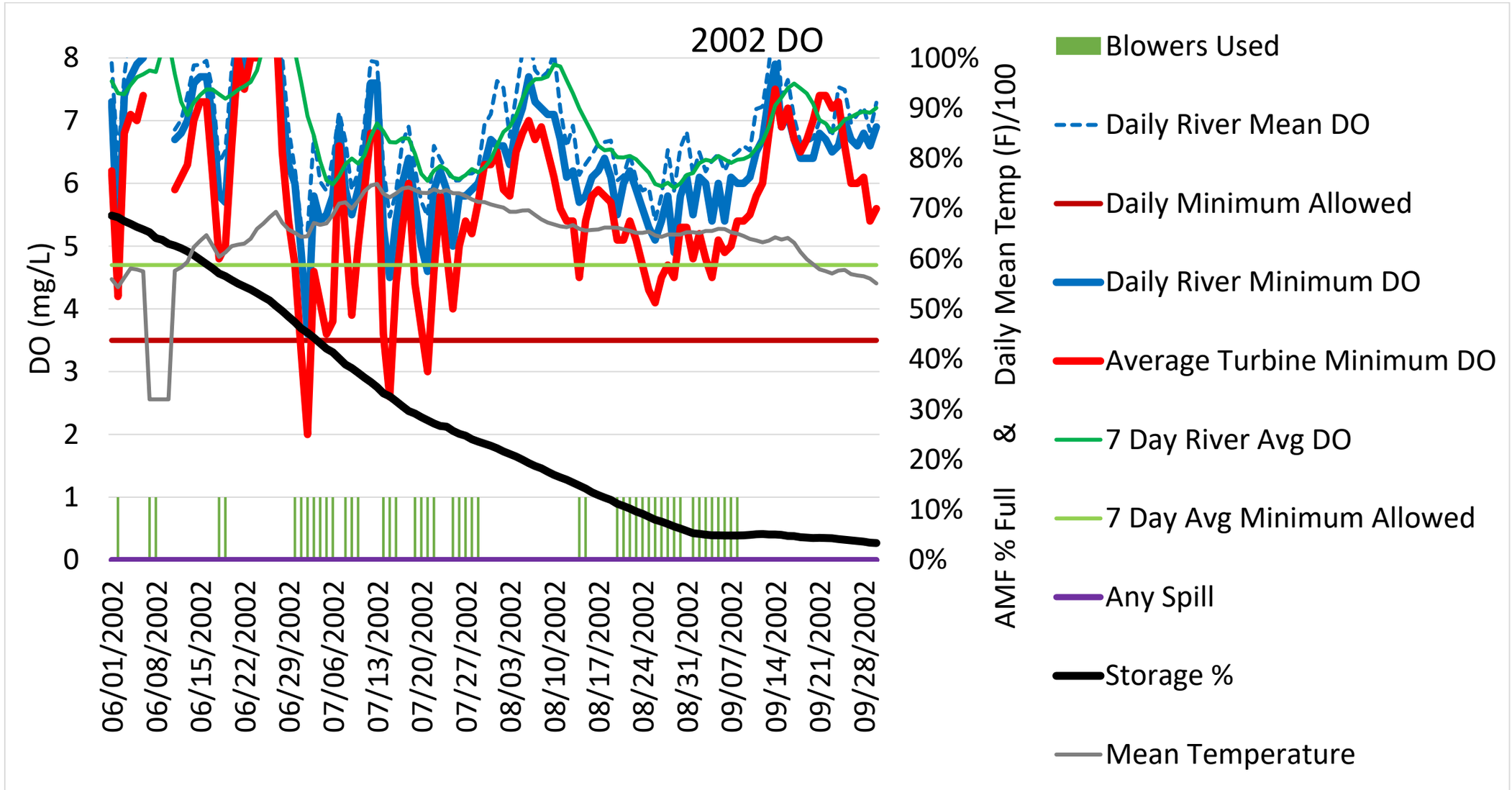
Project Success

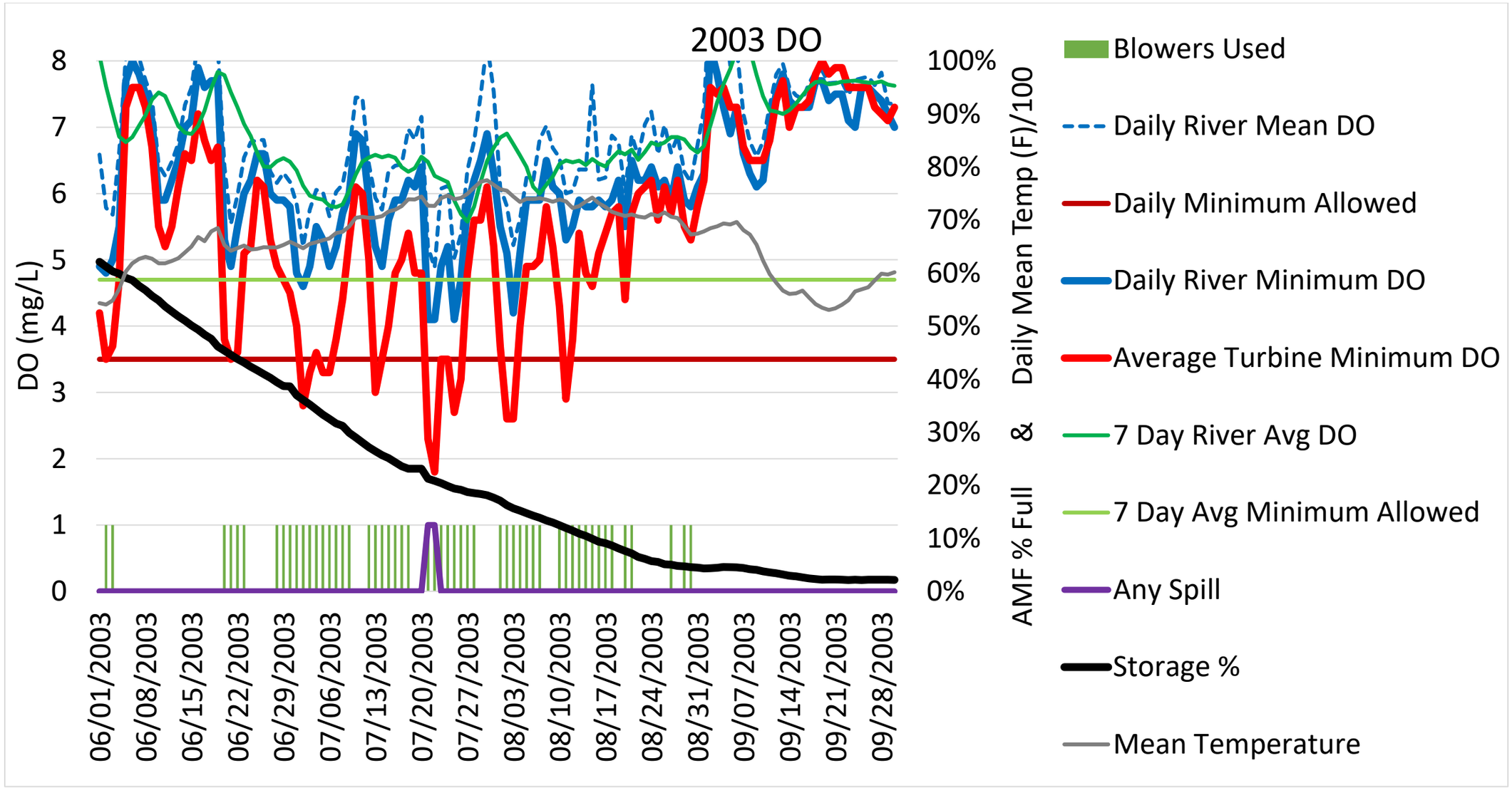
Project success will be determined by Reclamation's ability to meet the performance standards and by avoiding violation of state water quality standards during construction. Meetings with IDEQ, IDFG, and Idaho Power following the 2020 construction period will provide an opportunity to track and discuss the completion of objectives, and for potential adjustment of mitigative measures for the next construction season, as necessary.

Literature Cited

Parenthetical Reference	Bibliographic Citation
FERC 2018	Federal Energy Regulatory Commission (FERC). 2018. Complete List of Active Licenses available online at: https://www.ferc.gov/industries/hydropower/gen-info/licensing/app-new.asp (last accessed December 11, 2018).
Grossarth 2018	Grossarth, E. 2018. "Officials have figured out why hundreds of fish are dying near American Falls Dam." EastIdahoNews.com. Published August 7, 2018, update September 10, 2018. Available online at: https://www.eastidahonews.com/2018/08/officials-have-figured-out-why-fish-are-dying-near-the-american-falls-dam/ (last accessed May 6, 2019)
IDA 2019	Idaho Department of Administration (IDA), Office of the Administrative Rules Coordinator. 2019. IDAPA 58 Administrative Rules, 58.01.02 Idaho Water Quality Standards. Available online at: https://adminrules.idaho.gov/rules/current/58/580102.pdf (last accessed May 6, 2019)
IDEQ 2012	Idaho Department of Environmental Quality (IDEQ). 2012. "Lake Walcott Subbasin Assessment and Total Maximum Daily Loads Five-Year Review." May 2012.
Reclamation 1995	U.S. Bureau of Reclamation (Reclamation). 1995. "American Falls Resource Management Plan." Reclamation, Pacific Northwest Region, Boise, Idaho. April 1995.

Attachment 1: Dissolved Oxygen Concentrations and Hydrologic Conditions at and Immediately Below American Falls Dam

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06/01/2003
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09/28/2003
Blowers Used
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Daily River Minimum DO
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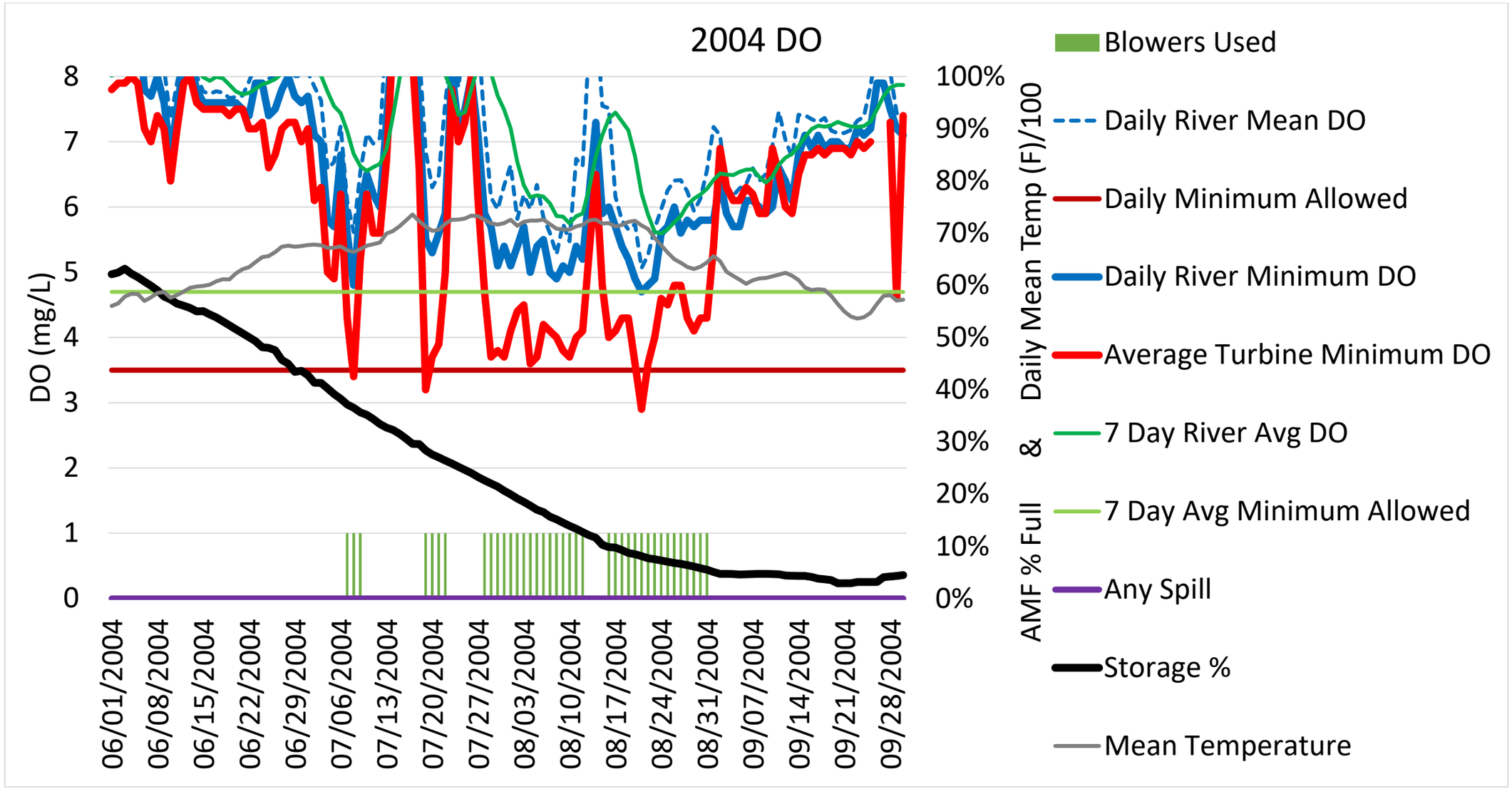
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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AMF % Full & Daily Mean Temp (F)/100
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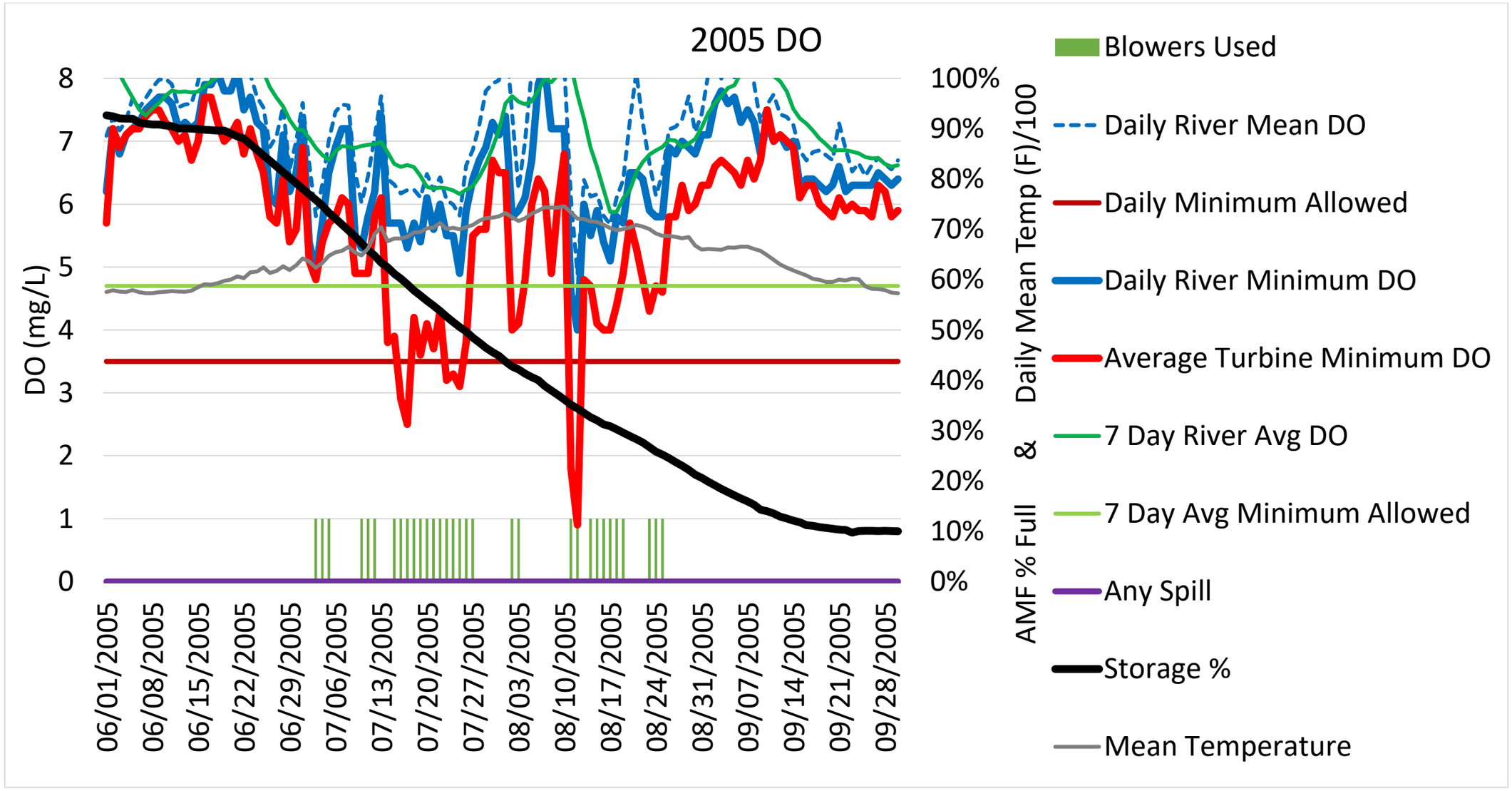
Any Spill
Storage %
Mean Temperature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08/24/2005
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09/21/2005
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Blowers Used
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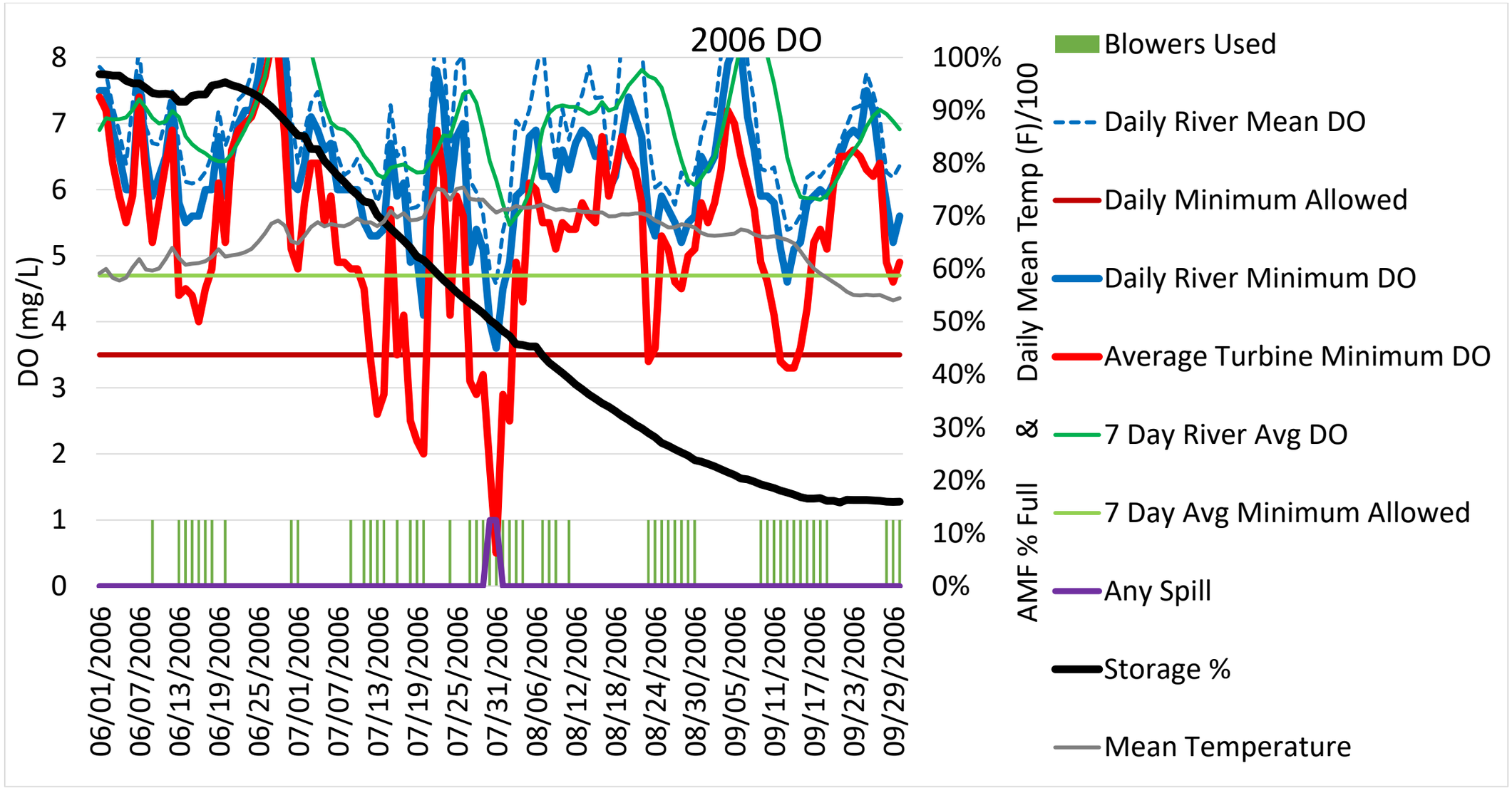
Any Spill
Storage %
Mean Temperature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09/29/2006
Blowers Used
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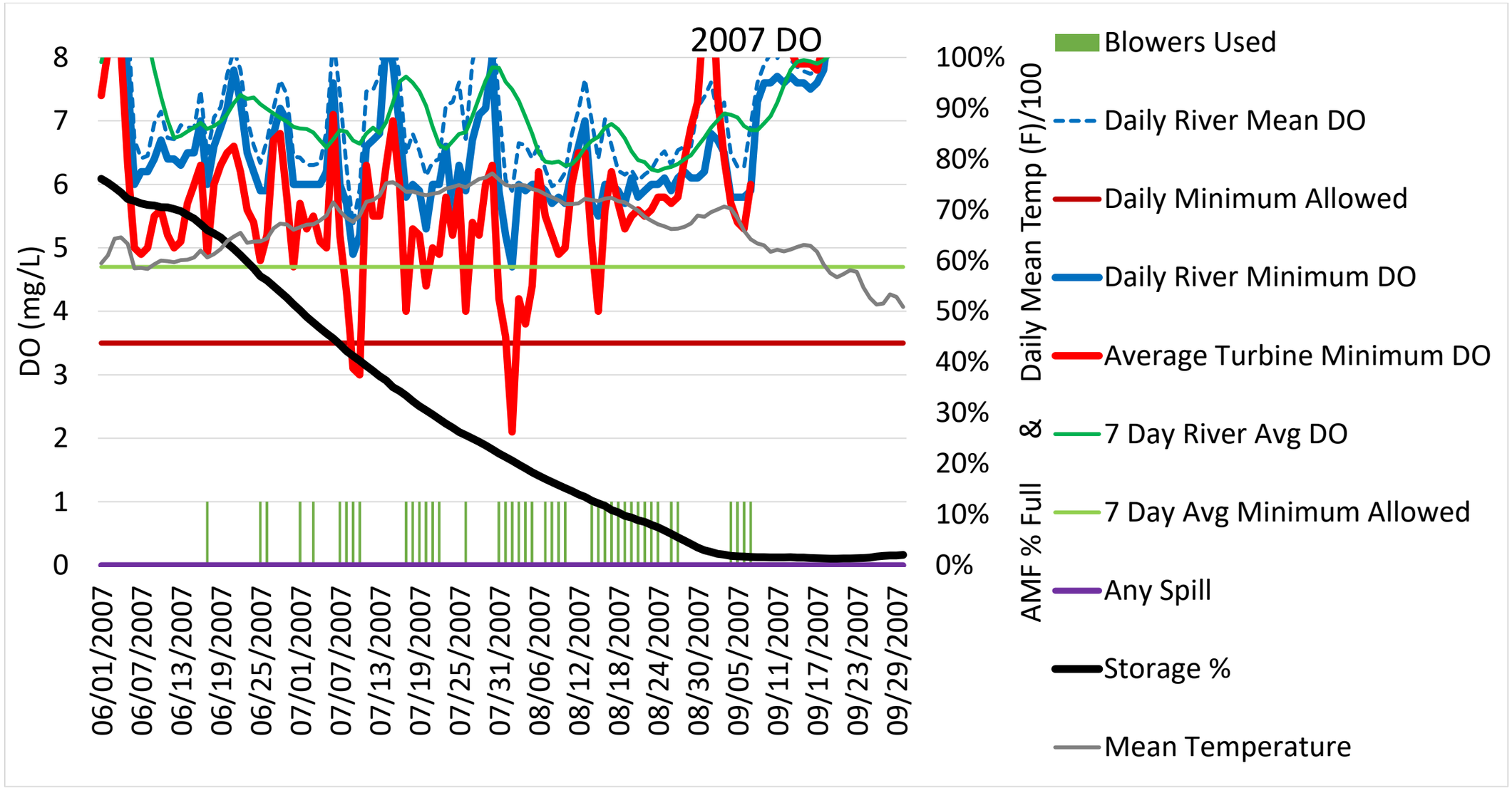
Any Spill
Storage %
Mean Temperature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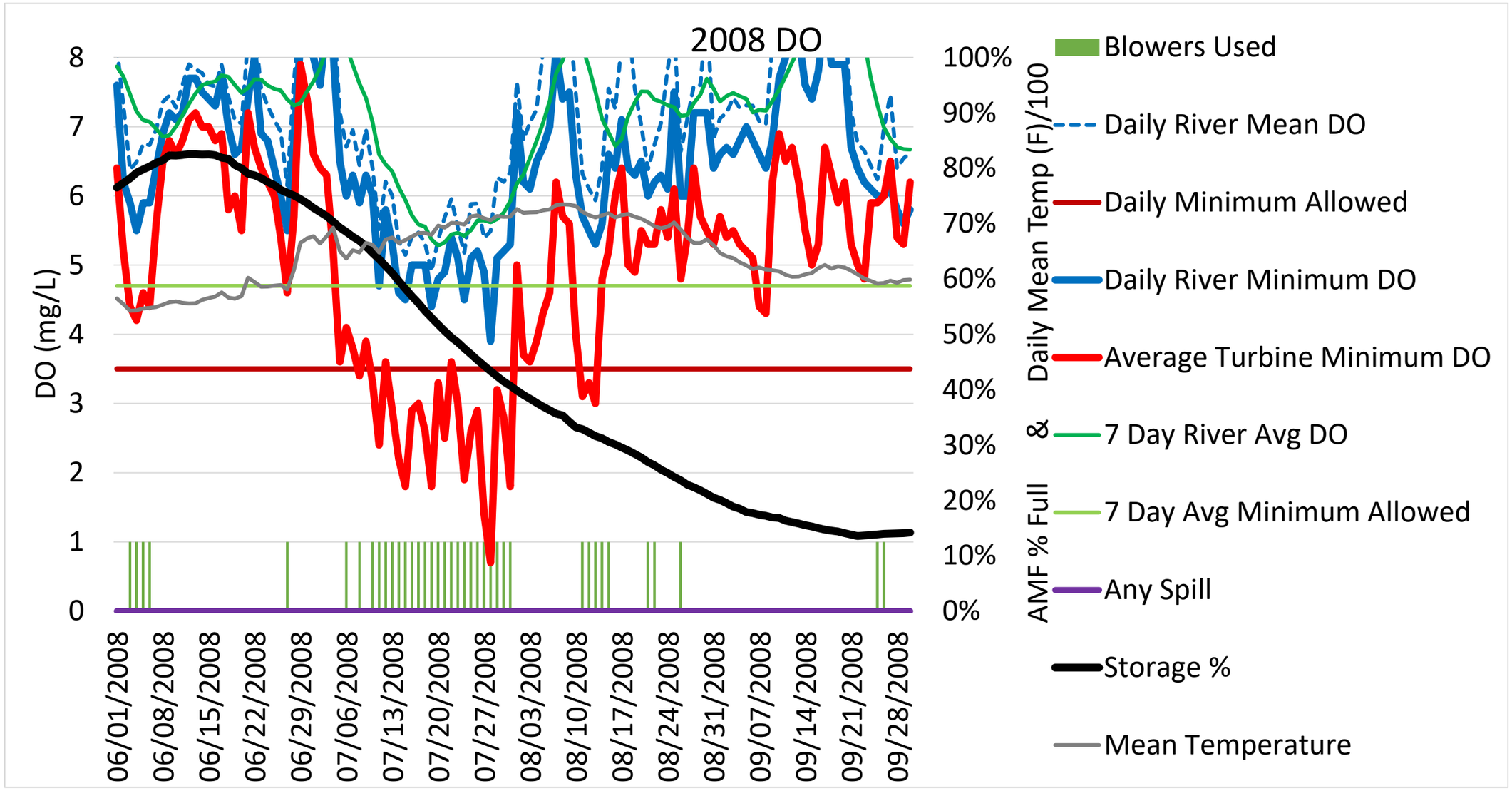
Any Spill
Storage %
Mean Temperature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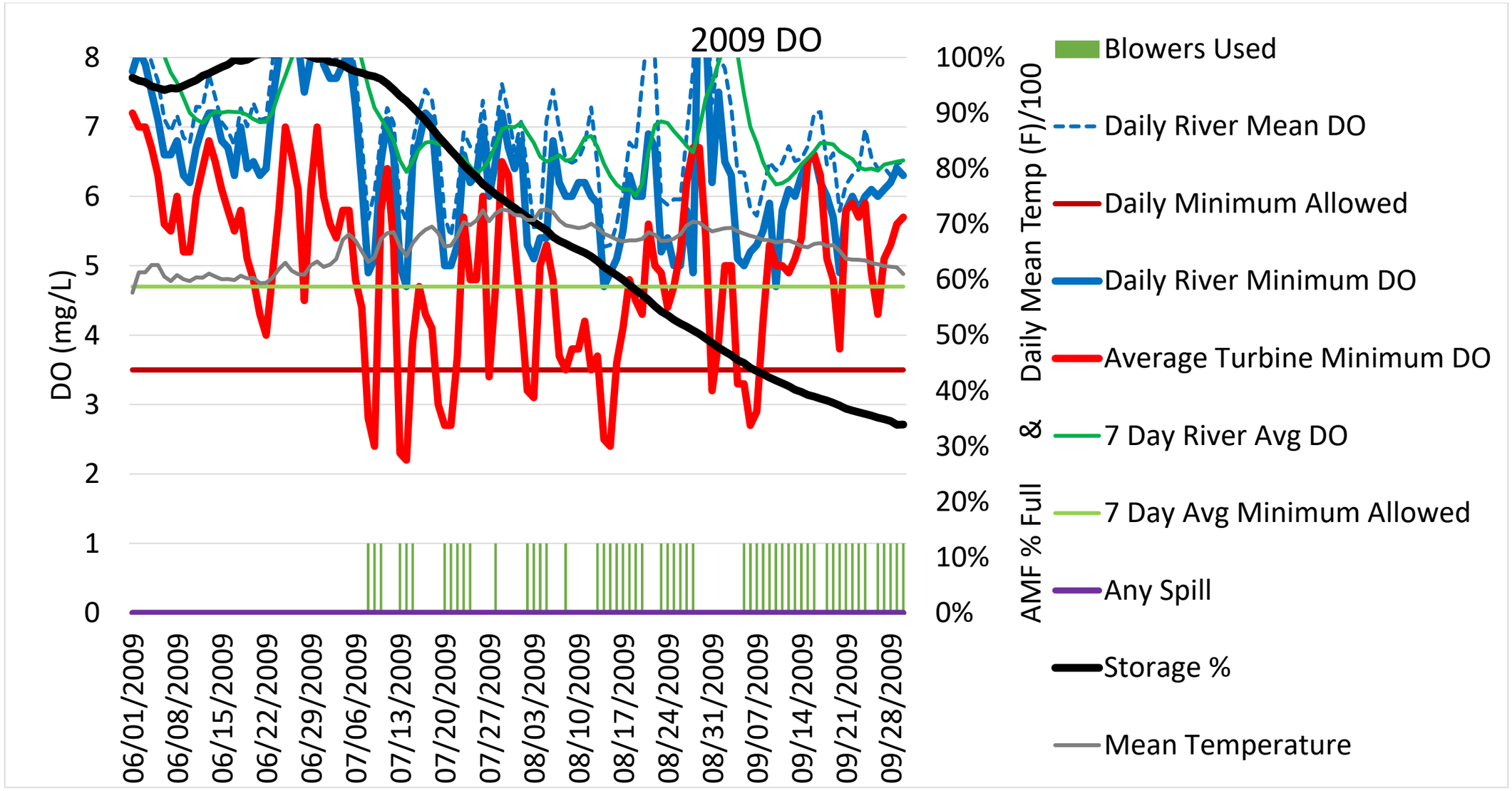
Any Spill
Storage %
Mean Temperature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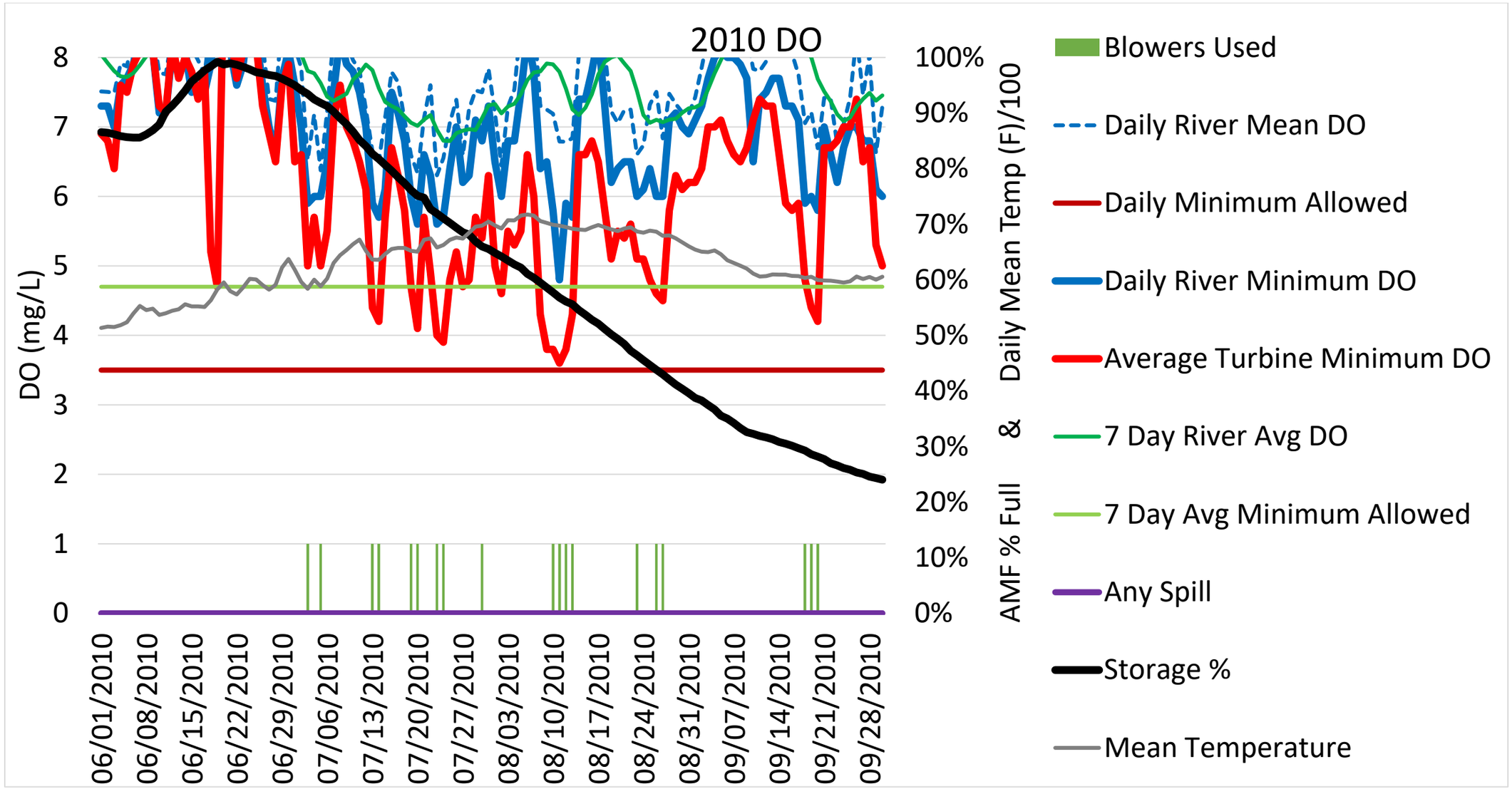
Any Spill
Storage %
Mean Temperature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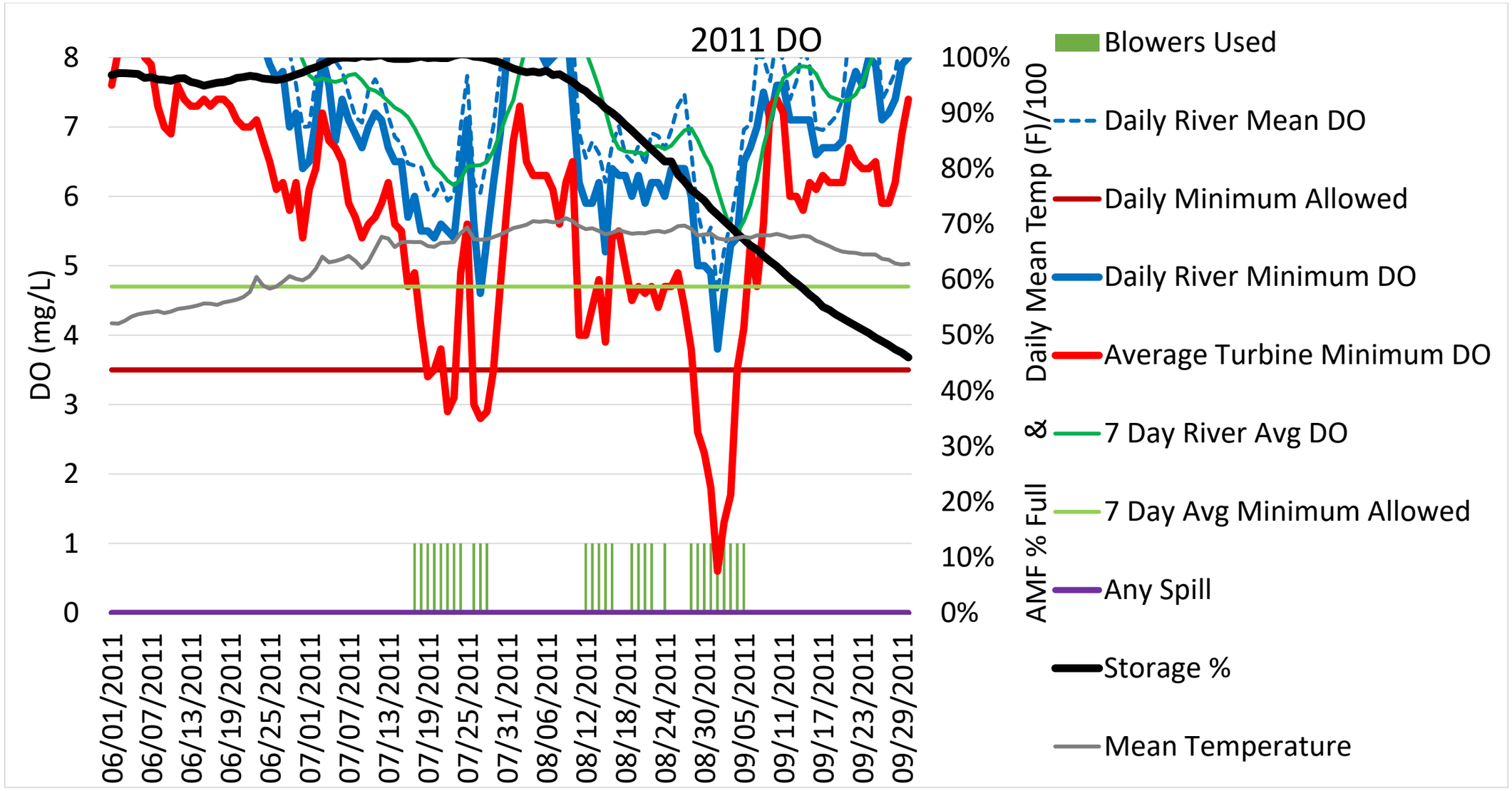
Storage %
Mean Temperature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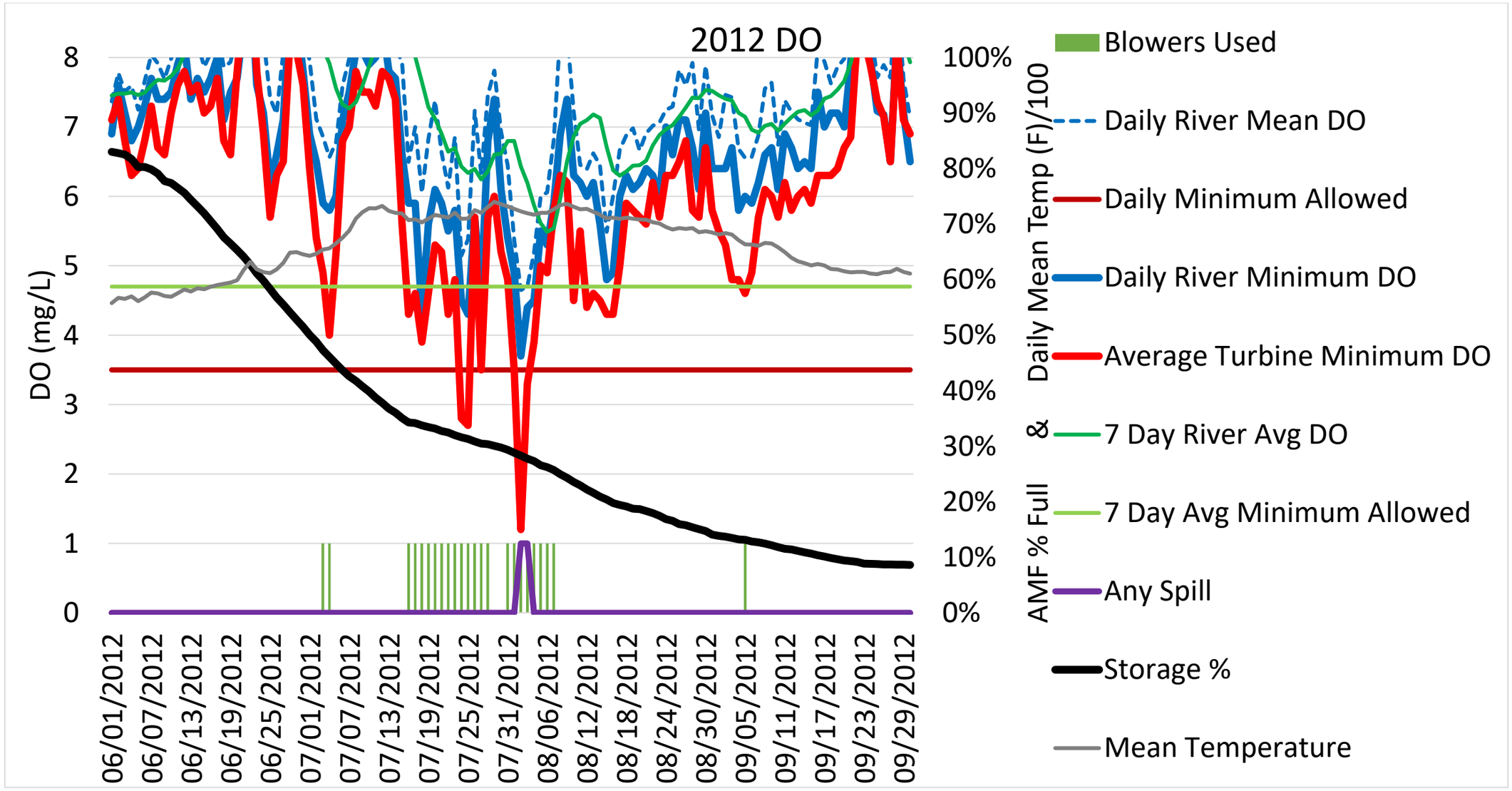
Any Spill
Storage %
Mean Temperature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Blowers Used
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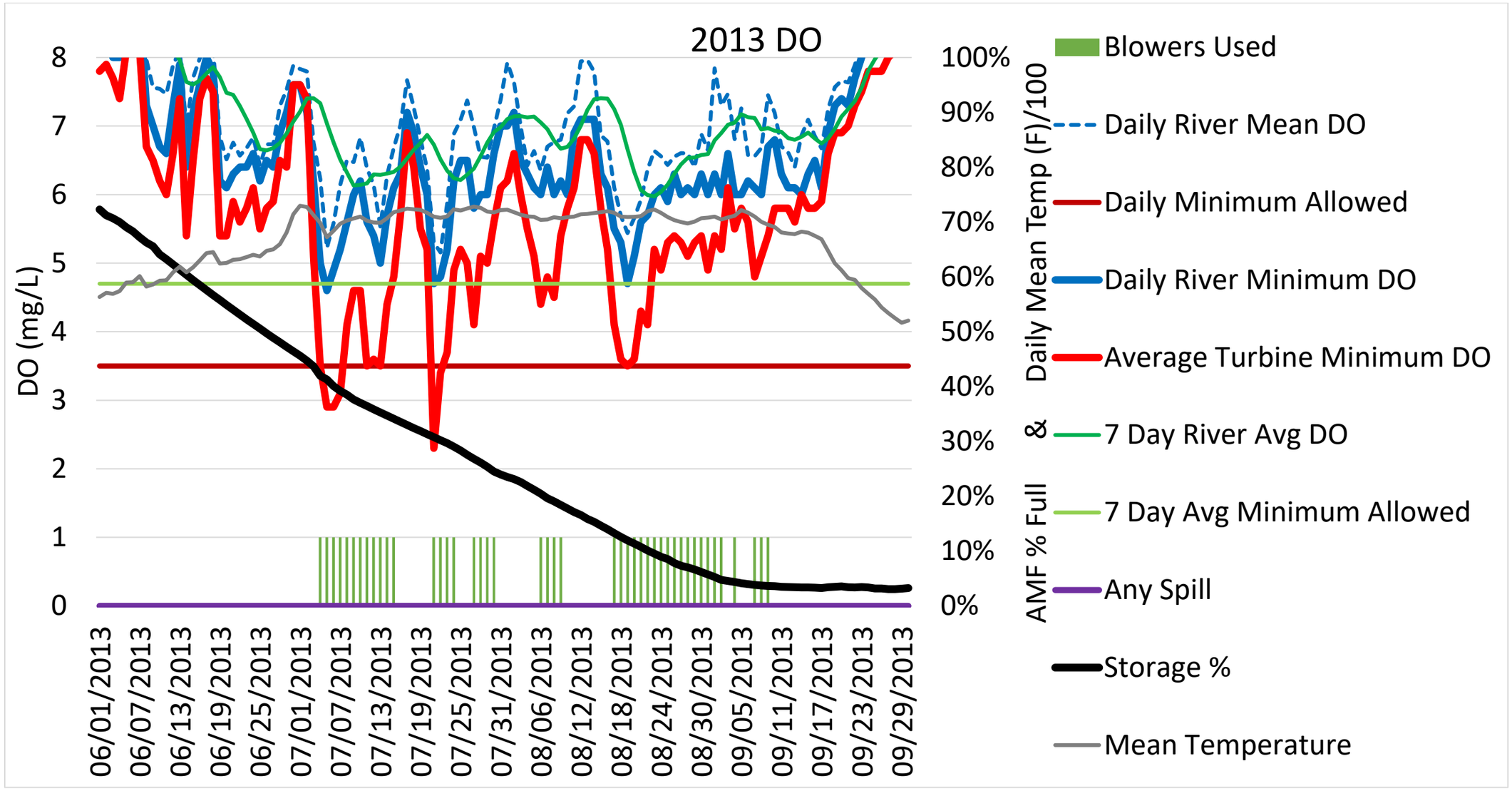
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
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09/23/2013
09/29/2013
Blowers Used
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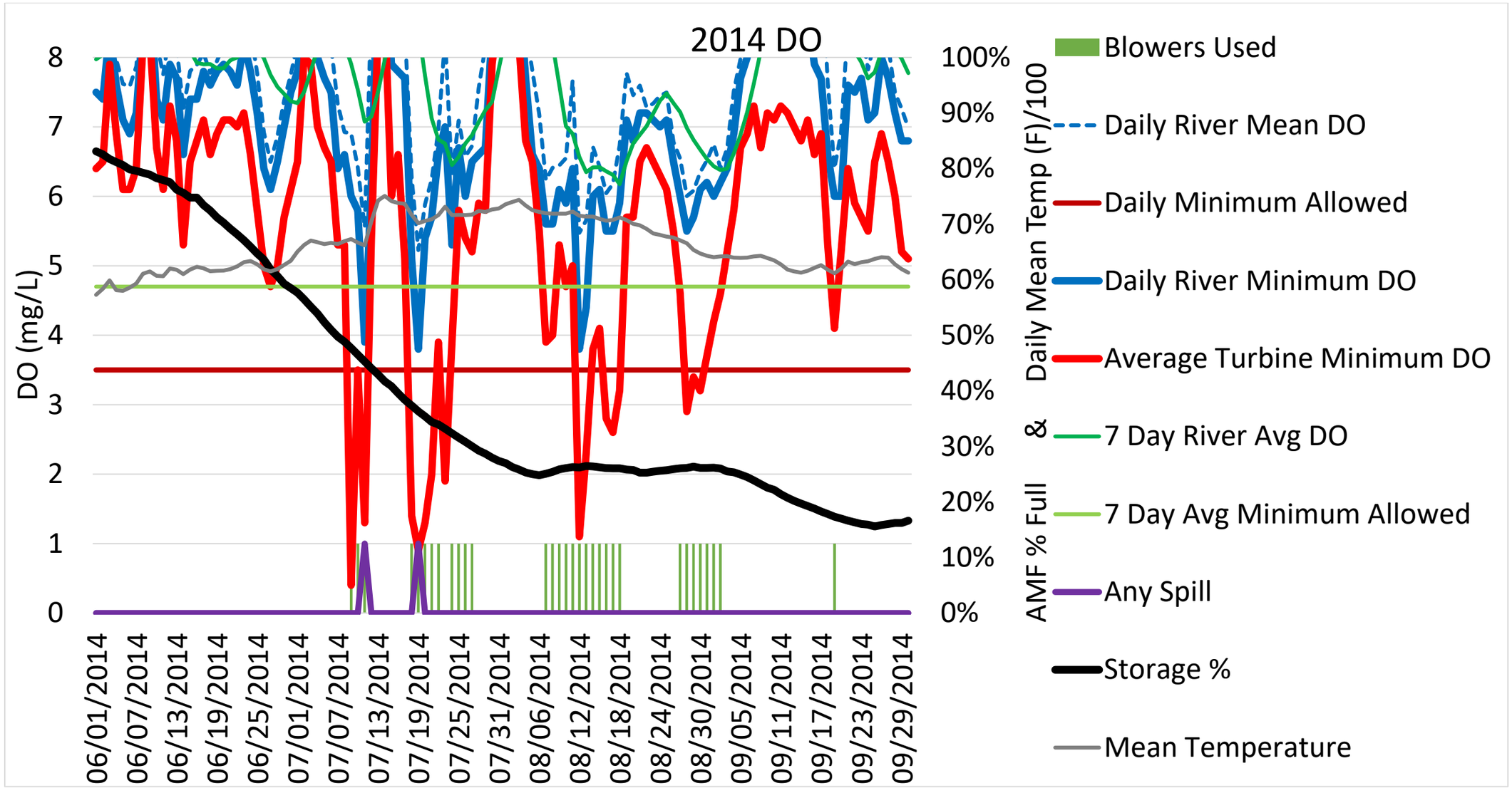
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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AMF % Full & Daily Mean Temp (F)/100
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09/23/2014
09/29/2014
Blowers Used
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Daily Minimum Allowed
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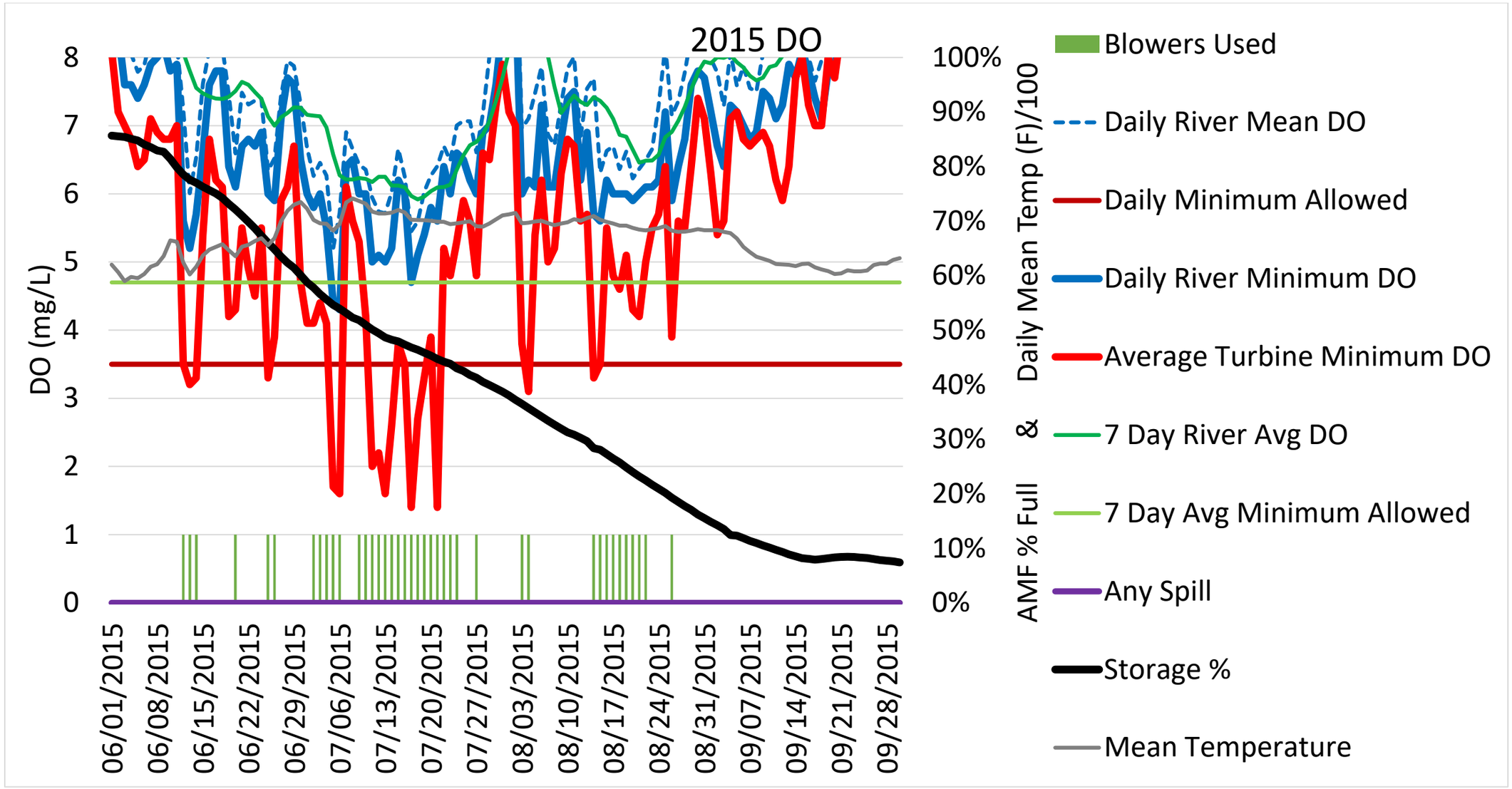
Any Spill
Storage %
Mean Temperature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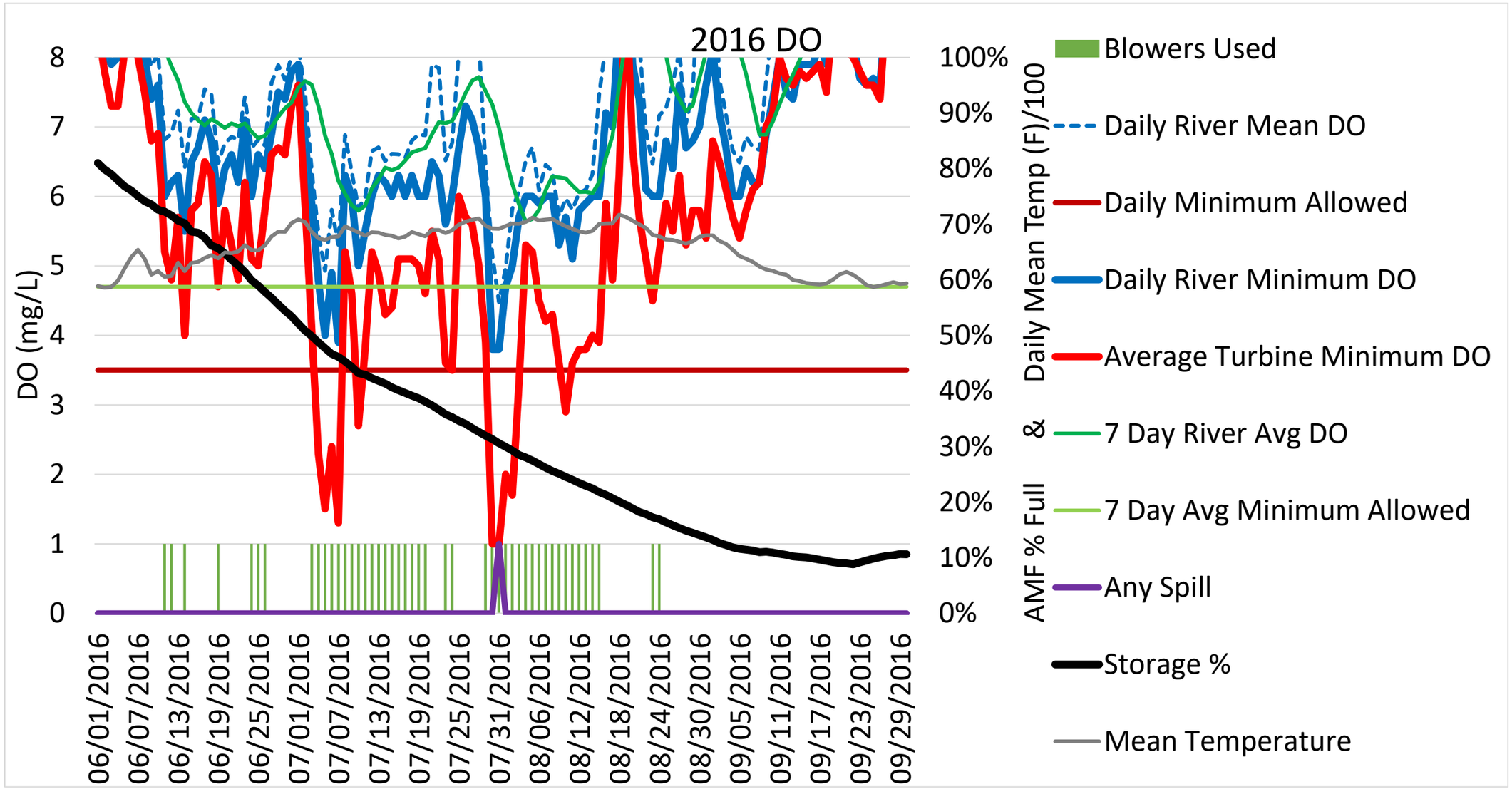
09/21/2015
09/28/2015
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature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DO (mg/L)
Daily Mean Temp (F)/100 & AMF % Full
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06/01/2016
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06/19/2016
06/25/2016
07/01/2016
07/07/2016
07/13/2016
07/19/2016
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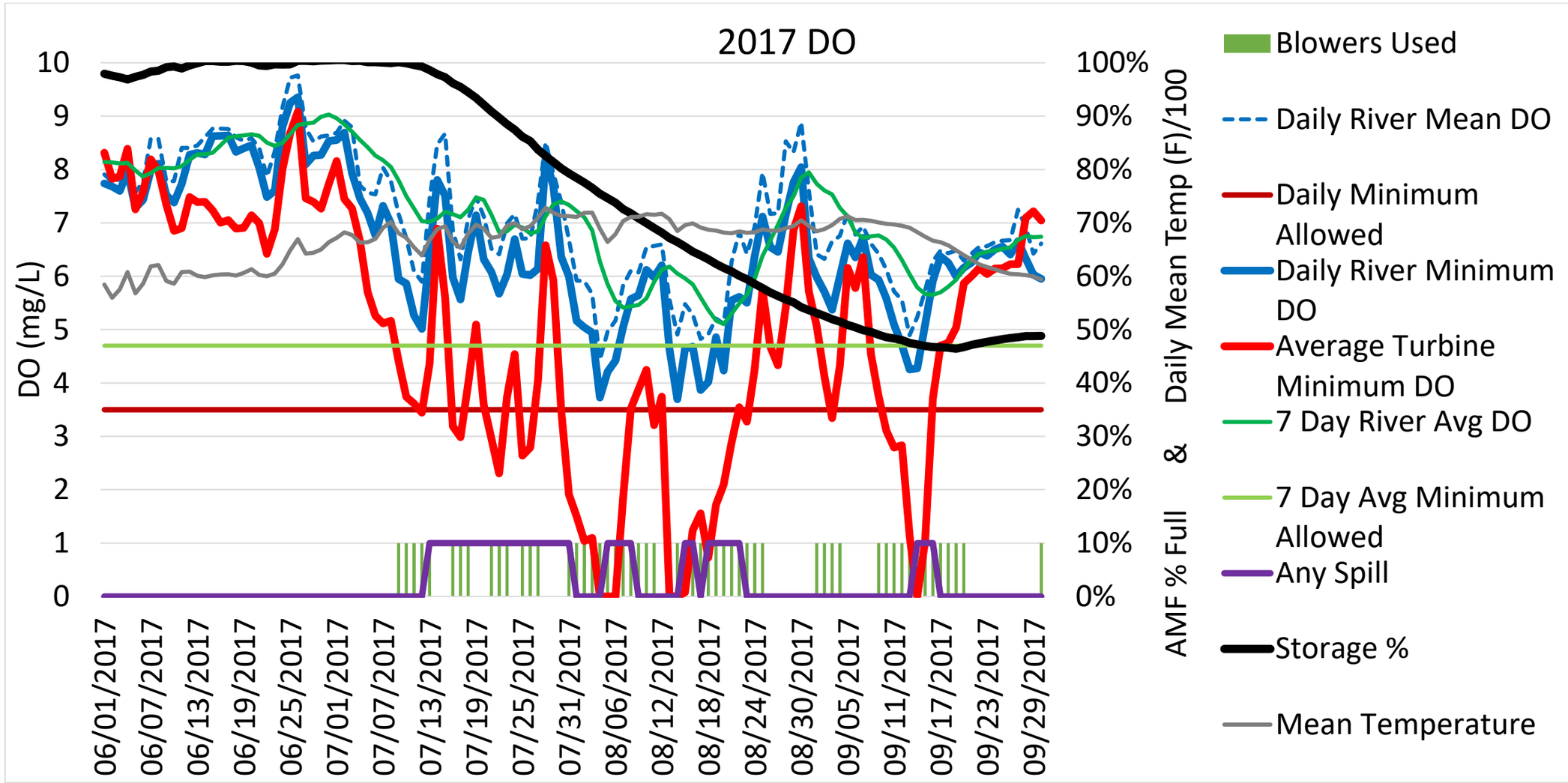
08/12/2016
08/18/2016
08/24/2016
08/30/2016
09/05/2016
09/11/2016
09/17/2016
09/23/2016
09/29/2016
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature


2017 DO
DO (mg/L)
AMF % Full & Daily Mean Temp (F)/100
10
9
8
7
6
5
4
3
2
1
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
06/01/2017
06/07/2017
06/13/2017
06/19/2017
06/25/2017
07/01/2017
07/07/2017
07/13/2017
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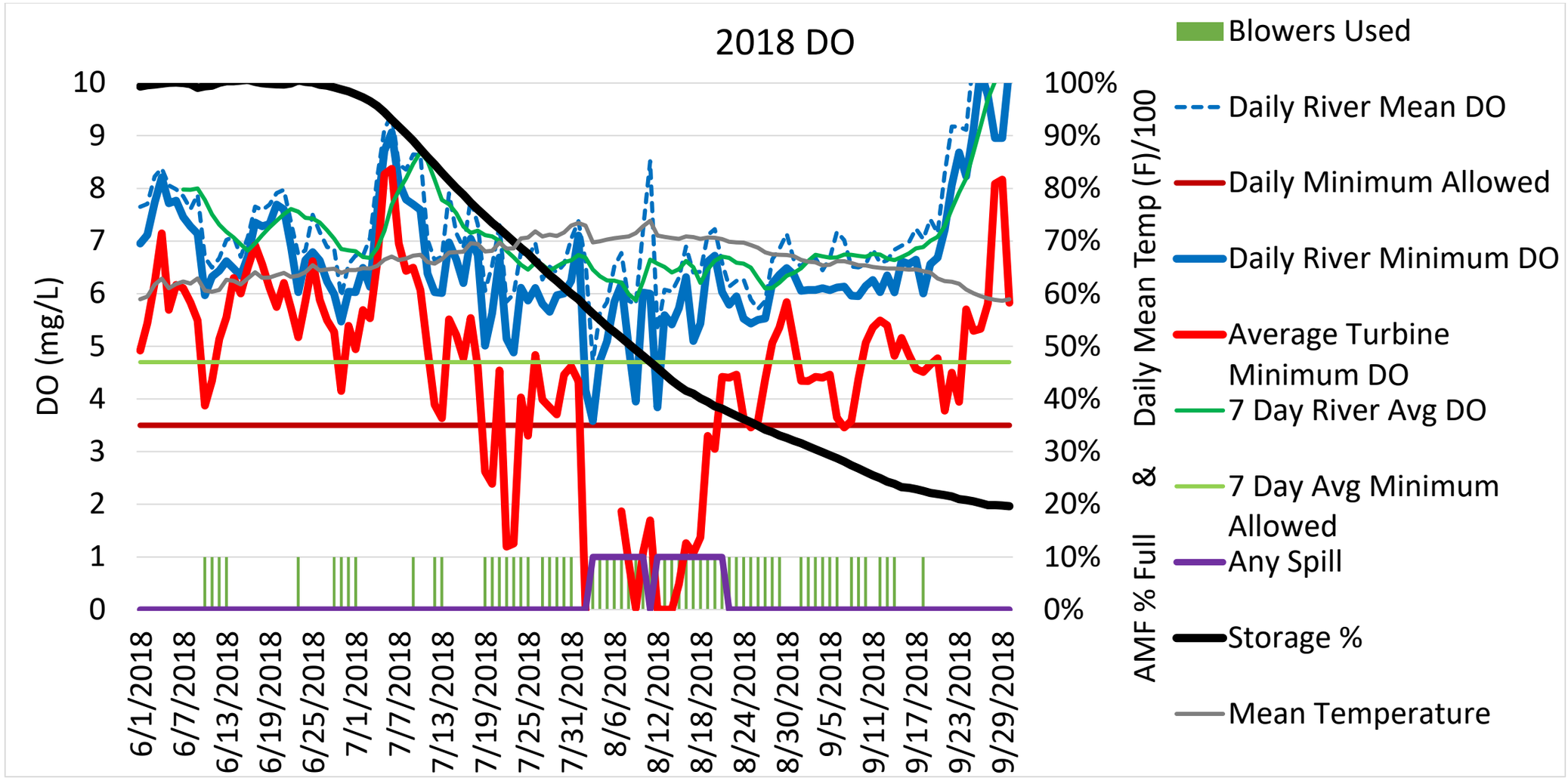
07/25/2017
07/31/2017
08/06/2017
08/12/2017
08/18/2017
08/24/2017
08/30/2017
09/05/2017
09/11/2017
09/17/2017
09/23/2017
09/29/2017
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature


2018 DO
DO (mg/L)
10
9
8
7
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4
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100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
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6/1/2018
6/7/2018
6/13/2018
6/19/2018
6/25/2018
7/1/2018
7/7/2018
7/13/2018
7/19/2018
7/25/2018
7/31/2018
8/6/2018
8/12/2018
8/18/2018
8/24/2018
8/30/2018
9/5/2018
9/11/2018
9/17/2018
9/23/2018
9/29/2018
Daily Mean Temp (F)/100 & AMF % Full
Blowers Used
Daily River Mean DO
Daily Minimum Allowed
Daily River Minimum DO
Average Turbine Minimum DO
7 Day River Avg DO
7 Day Avg Minimum Allowed
Any Spill
Storage %
Mean Temperature

APPENDIX E

Map of Designated Transportation Routes/Staging Areas

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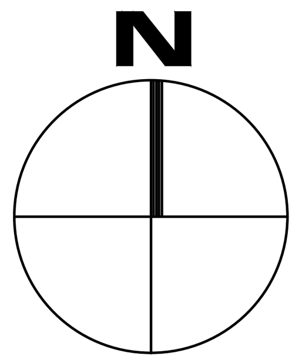
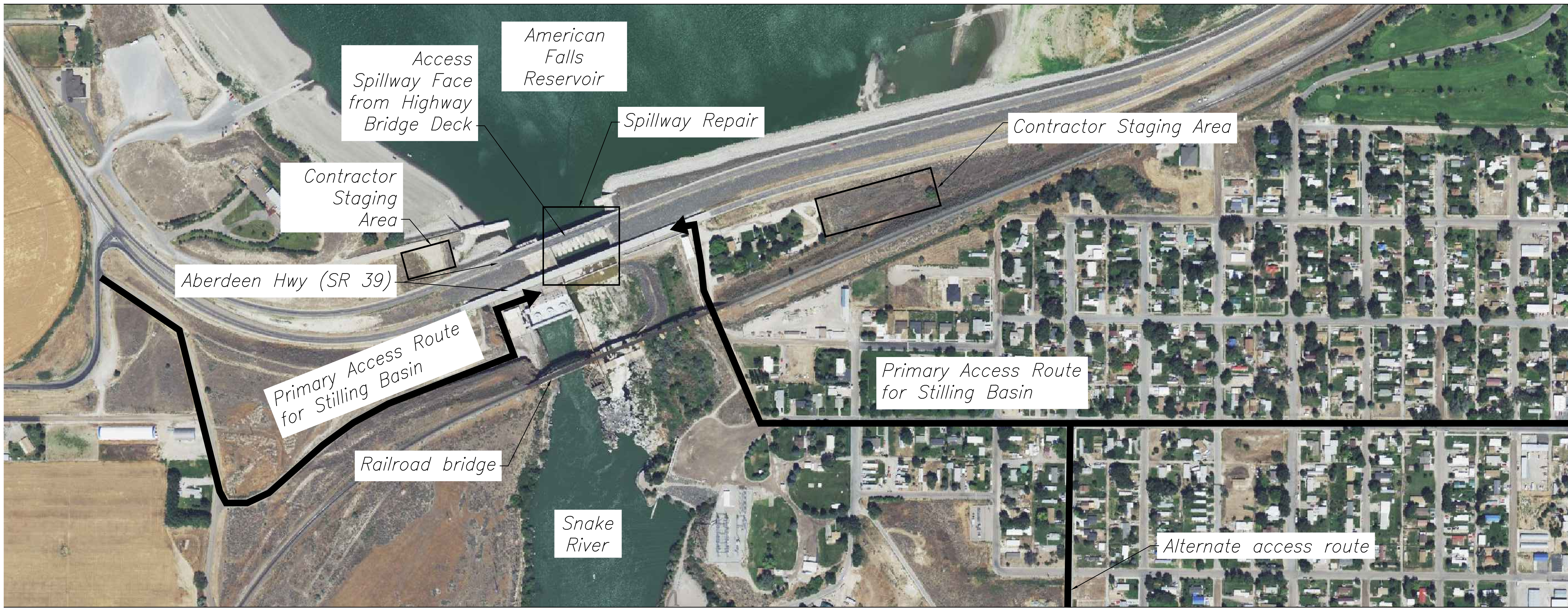


Notes:
1. Coi -r ı - ı - ide ı-i- and coordin ı- primary access rou- prioı - ı -ru -ion.
2. Coi -r ı - ı - ri- ize and loc ı-ioı -aging area wi-h Coi -r ı -in ȷ -icer prioı - ı -ru -ion.
3. Acce - pillwa -a -rom SR39 will require l -aile l -r ı -ic coı -rol plan. Coı -r ı - ı - prepaı -r ı -ic coı -rol plan and coordin ı- i-h Coı -r ı -in ȷ -iceı - r approval by Idaho Transpoı - ı-ion Depaı -meı -.



SITE PLAN

100 0 100 200 300
SCALE OF FEET

RECLAMATION
Managing Water in the West

-LWAYS THINK SAFETY

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REV NO			
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A. H ı- h
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L. Soderlind
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Hovde, Jay B. P.=.
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Spindler, Charl -
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APPENDIX F

Consultation Letters to Tribes and State Historic Preservation Office

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United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

IN REPLY REFER TO:

USF-1219
LND/ENV-1.10

MAR 2 9 2017

VIA FEDERAL EXPRESS

Ms. Mary Anne Davis
Associate State Archaeologist
State Historic Preservation Office
210 Main Street
Boise, ID 83702

Subject: Invitation to Consult on the Proposed American Falls Spillway Concrete Repairs Project, American Falls Dam, Power County, Idaho

Dear Ms. Davis:

The Bureau of Reclamation's Upper Snake Field Office is proposing to repair portions of the American Falls Dam spillway. The dam is located in T.7 S, R.21 E, Section 30, American Falls SW and American Falls, Idaho, 1:24,000 U.S. Geological Survey Quad Sheets. At this time, Reclamation is consulting concerning the area of potential effect (APE) and a finding of No Historic Properties Affected.

The American Falls Dam was replaced in the mid-1970s and has not reached 50 years of age nor achieved historical significance in the past 50 years. No historic properties have been identified within the APE of this project, therefore, Reclamation has determined that this will result in No Historic Properties Affected.

In accordance with procedures specified in 36 CFR § 800, Reclamation requests your concurrence with our APE and the determination that modernizing this equipment will result in No Historic Properties Affected. Please direct any questions to Ms. Nikki Polson, Upper Snake Field Office Archaeologist, at 208-678-0461, extension 13, or by email at npolson@usbr.gov.

Sincerely,

ACTING FOR Roland K. Springer
Area Manager

Enclosure

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

IN REPLY REFER TO:

USF-1219
LND/ENV-1.10

MAR 2 9 2017

VIA FEDERAL EXPRESS

Honorable Blaine Edmo
Chairman
Fort Hall Business Council
Shoshone-Bannock Tribes
1 Pima Drive
Fort Hall, ID 83203-0306

Subject: Invitation to Consult on the Proposed American Falls Spillway Concrete Repairs Project, American Falls Dam, Power County, Idaho

Dear Mr. Chairman:

The Bureau of Reclamation's Upper Snake Field Office is proposing to repair portions of the American Falls Dam spillway. The dam is located in T.7 S, R.21 E, Section 30, American Falls SW and American Falls, Idaho, 1:24,000 U.S. Geological Survey Quad Sheets. At this time, Reclamation is requesting any information concerning cultural resources known to your Tribe that may be affected by this project.

The American Falls Dam was replaced in the mid-1970s and has not reached 50 years of age nor achieved historical significance in the past 50 years and no other historic properties have been identified within the area of potential effect of this project.

Please advise this office as to whether the Shoshone-Bannock Tribes wish to join in this consultation by contacting me directly at 208-383-2246 or via email at rspringer@usbr.gov. Or you may contact my staff archaeologist, Ms. Nikki Polson, at 208-678-0461, extension 13, with any questions regarding this letter or the enclosure.

Sincerely,

ACTING FOR Roland K. Springer
Area Manager

Enclosure

cc: See next page.

cc: Ms. Yvette Tuell
Environmental Program Manager
Shoshone-Bannock Tribes
1 Pima Drive
Fort Hall, ID 83203-0306

Ms. Carolyn B. Smith
Cultural Resources Coordinator
Shoshone-Bannock Tribes
1 Pima Drive
Fort Hall, ID 83203-0306
(w/encl to each)

www.history.idaho.gov

Idaho • State Historical SOCIETY

C.L. "Butch" Otter
Governor of Idaho

Janet Gallimore
Executive Director

Administration
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2682
Fax: (208) 334-2774

Membership and Fund Development
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 514-2310
Fax: (208) 334-2774

Historical Museum and Education Programs
610 North Julia Davis Drive
Boise, Idaho 83702-7695
Office: (208) 334-2120
Fax: (208) 334-4059

State Historic Preservation Office and Historic Sites Archeological Survey of Idaho
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3861
Fax: (208) 334-2775

Statewide Sites:
• Franklin Historic Site
• Pierce Courthouse
• Rock Creek Station and
• Stricker Homesite

Old Penitentiary
2445 Old Penitentiary Road
Boise, Idaho 83712-8254
Office: (208) 334-2844
Fax: (208) 334-3225

Idaho State Archives
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2620
Fax: (208) 334-2626

North Idaho Office
112 West 4th Street, Suite #7
Moscow, Idaho 83843
Office: (208) 882-1540
Fax: (208) 882-1763

DATE: April 21, 2017
TO: Roland K. Springer
FEDERAL AGENCY: Bureau of Reclamation
PROJECT NAME: Proposed American Falls Spillway concrete Repairs Project, American Falls Dam, Power County, Idaho

Section 106 Evaluation

X The field work and documentation presented in this report meet the Secretary of the Interior's Standards.

No additional investigations are recommended. Project can proceed as planned.

Additional information is required to complete the project review. (See comments below.)

Additional investigations are recommended. (See comments below).

Identification of Historic Properties (36 CFR 900.4):

No historic properties were identified within the project area.

Property is not eligible. Reason:

Property is eligible for listing in the National Register of Historic Places.

Criterion: _A _ B_ C _ D Context for Evaluation:

X *No historic properties* will be affected within the project area.

Assessment of Adverse Effects (36 CFR 800.5):

Project will have *no adverse effect* on historic properties.

Property will have an *adverse effect* on historic properties. Additional consultation is required.

Comments: Please contact me at 208-488-7472 if you have any questions about our comments and reference SHPO REV 2017-639.

// Mary Anne Davis // **April 21, 2017**

Mary Anne Davis, Associate State Archaeologist **Date**
State Historic Preservation Office

Cc: Nikki Polson, BOR

APPENDIX G

USFWS IPaC Report

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IP **U.S. Fish & Wildlife Service** 5

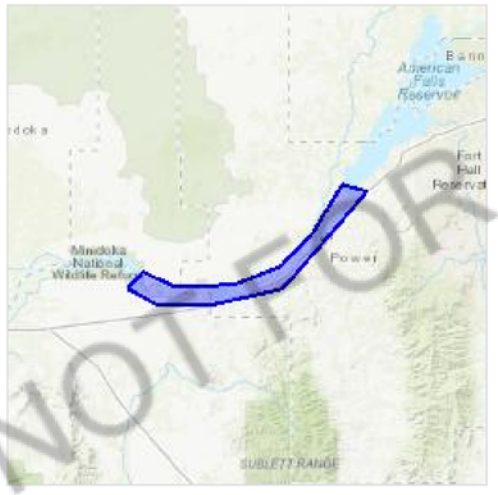
IPaC resource lis

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be 5 directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Blaine, Cassia and Power counties, Idaho



Local office

Idaho Fish And Wildlife Office

(208) 378-5243
(208) 378-5262

1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657 5

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the ɔpecieɔ by reducing or eliminating water flow downɔtream). Becauɔe ɔecieɔ can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and 5 project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

. Species listed under the Endangered Species Act are threatened or endangered. IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE.

"BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626
Breeds Dec 1 to Aug 31

Brewer's Sparrow Spizella breweri
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9291
Breeds May 15 to Aug 10

Clark's Grebe Aechmophorus clarkii
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds Jan 1 to Dec 31

Golden Eagle Aquila chrysaetos
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/1680
Breeds Dec 1 to Aug 31

Lesser Yellowlegs Tringa flavipes
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679
Breeds elsewhere

Long-billed Curlew Numenius americanus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511
Breeds Apr 1 to Jul 31

Marbled Godwit Limosa fedoa
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481
Breeds elsewhere

Sage Thrasher Oreoscoptes montanus
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9433
Breeds Apr 15 to Aug 10

Willet Tringa semipalmata
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds Apr 20 to Aug 5

Probability of Prese ce Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report. 5

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

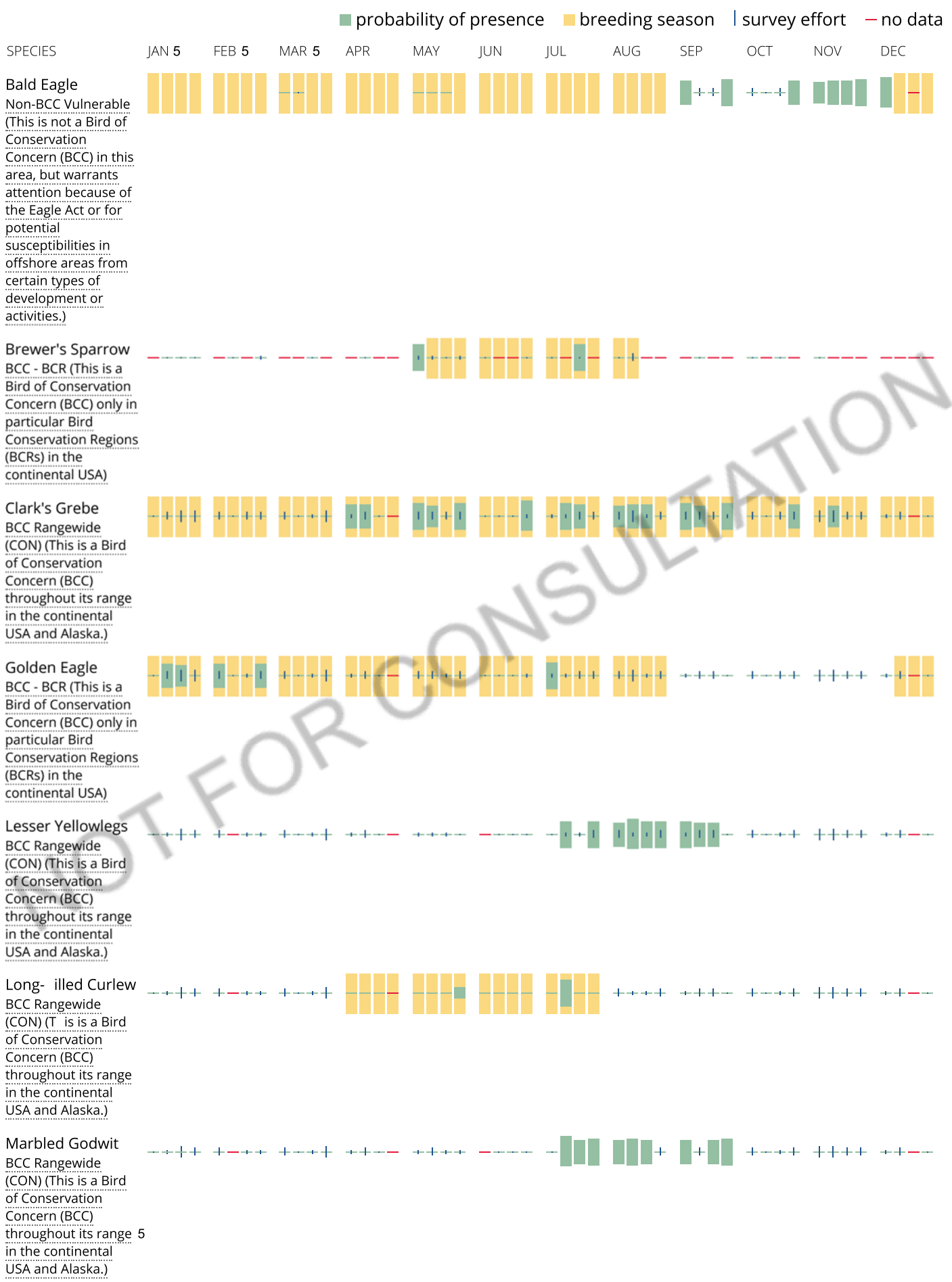
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Surve Effort (|)
ertical black li es superimposed o probability of prese ce bars i dicate the umber of surveys 5 performed for that species i the 10km grid cell(s) your project area overlaps. The umber of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

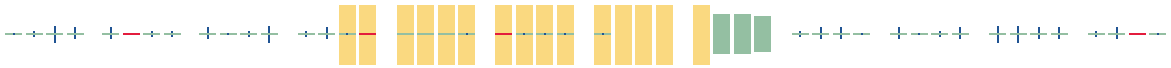
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse. 5



Sage Thrasher
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation 5 Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurri g i my specified locatio ?

The probability of presence graphs associated with your migratory bird list are based on data provided by the 5 Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds 5

guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds? 5

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range 5 anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to 5 avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list ge erated is ot a list of all birds i your project area, o ly a subset of birds of priority co cer . To lear more about how your list is ge erated, a d see optio s for ide tifyi g what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or

minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands 5

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
Minidoka National Wildlife Refuge	22,463.82 acres

(208) 436-3589
(208) 436-1570

961 East Minidoka Dam
Rupert, ID 83350-9414

https://www.fws.gov/refuges/profiles/index.cfm?id=14614

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventor

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under ection 404 of the Clean Water Act, or other State/Federal statutes. 5

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands: 5

FRESHWATER EMERGENT WETLAND

- PEM1Ch
- PEM1C
- PEM1Fh
- PEM1Ah
- PEM1A
- PEM1F
- PEM1Cx
- PEM1Ax
- PEM1B

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1Ch
- PSS1A
- PSS1B
- PFO1Ch
- PSS1Ah
- PFO1C
- PSS1C
- PFO1A

FRESHWATER POND

- PUBHx
- PUSC
- PUSA
- PUBH
- PUBF
- PUBHh
- PAB3Hh
- PABF
- PABH

LAKE

- L1UBHh
- L2USAh
- L2USCh

RIVERINE

- R4SBA
- R4SBC
- R3UBH
- R2UBHx
- R5UBFx
- R3UBF
- R4SBCx
- R4SBJ
- R5UBH
- R3UBHx

A full description for each wetland code can be found at the National Wetlands Inventory website 5

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in 5 revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX H

Scoping Recipient List and Information Package

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Category	First Name	Last Name	Organization	C/O	Address	City	State	Zip	Type
									E.g., Proponent, local agency, State agency, Federal Agency, adjacent landowner, interested party/organization
			e.g., Irrigation District, NGO, Municipality Office (Planning, zoning, Board of Commissioners, etc.)	Local office, Department, etc.					
State Agencies	Lynn	Van Every	Idaho DEQ		444 Hospital Way, STE 300	Pocatello	ID	83201	State agency
	Dan	Garren	Idaho Department of Fish & Game		1345 Barton Road	Pocatello	ID	83204	State agency
	Dave	Teuscher	Idaho Department of Fish & Game		1345 Barton Road	Pocatello	ID	83204	State agency
			- American Falls Fish Hatchery		2974 Fish Hatchery Road	American Falls	ID	83211	State agency
	Martin	Koenig	Idaho Department of Fish & Game		P.O. Box 25, 600 South Walnut St.	Boise	ID	83712	State agency
	Corey	Krunz	Idaho Department of Transportation		5151 S 5th Ave	Pocatello	ID	83204	
	John	Chatburn	Governor's Office of Energy & Mineral Resources		PO BOX 83720	BOISE	ID	83720-0199	
			Idaho State Police		5255 S 5th Ave	Pocatello	ID	83204	
Federal Agencies	Melissa	Warren	Bureau of Land Management		4350 Cliffs Drive	Pocatello	ID	83204	Federal Agency, fire station earby
	Rob	Brochu	USACE - Regulatory Division		900 N Skyline Dr A	IDAHO FALLS	ID	83402	Federal Agency
			Department of Indian Affairs (tribes below)						
City government	Marc	Beitia	City of American Falls		550 N Oregon Trail	American Falls	ID	83211	City government
	Brandon	Wilkinson	- American Falls Police Department		550 N Oregon Trail	American Falls	ID	83211	City department
	Pete	Williams	- American Falls Fire		550 N Oregon Trail	American Falls	ID	83211	City department
			-American Falls EMS		550 N Oregon Trail	American Falls	ID	83211	City department
	Cody	Moldenhauer	-American Falls Golf Course		550 N Oregon Trail	American Falls	ID	83211	City department
	Randy	Jensen	American Falls School District #381		827 Fort Hall	American Falls	ID	83211	School district
			City of Aberdeen		33 N. Main	Aberdeen	ID	83210	City government
			City of Pocatello (City Administrator)		911 N 7th Ave	Pocatello	ID	83201	City government
Tribes	*Chairman Nathan*	*Small*	*Shoshone-Bannock Tribes*		*85 W. Agency Road Building #82*	*Fort Hall*	*ID*	*83203*	*tribal government*
	Chairman Theodore	*Howard*	*Shoshone-Paiute Tribes*		*1623 Hospital Loop*	*Owyhee*	*NV*	*89832*	*tribal government*
County Govt.			Power County		543 Bannock Ave	American Falls	ID	83211	local government
			- Power County Waterways Committee		543 Bannock Ave	American Falls	ID	83211	local government
			Commissioners		543 Bannock Ave	American Falls	ID	83211	
			- Power County Public Lands Committee		543 Bannock Ave	American Falls	ID	83211	local government
			Power County Highway District		3090 Lamb Weston Rd	American Falls	ID	83211	local government
			- Power County Joint Traffic Coalition		3090 Lamb Weston Rd	American Falls	ID	83211	
	Jim	Jeffries	Power County Sheriff		550 Gifford St	American Falls	ID	83211	local government
	Di	Jones	Power County EMS/Fire		560 N Oregon Trail Road	American Falls	ID	83211	
			Bingham County		157 North Broadway Street	Blackfoot	ID	83221	
			- Commissioners		157 North Broadway Street	Blackfoot	ID	83221	
			- Bingham County Joint Traffic Coaliition		157 North Broadway Street	Blackfoot	ID	83221	
Spaceholders	Dan	Temple	A & B IRRIGATION DISTRICT		PO BOX 675	RUPERT	ID	83350-0675	AMF spaceholder
	Steven	Houser	ABERDEEN-SPRINGFIELD CANAL CO.		PO BOX 857	ABERDEEN	ID	83210	AMF spaceholder
	DAN	SHEWMAKER	AMERICAN FALLS RESERVOIR DISTRICT		PO BOX A	JEROME	ID	83338	AMF spaceholder
	LYNN	HARMON	AMERICAN FALLS RESERVOIR DISTRICT #2		409 N APPLE ST	SHOSHONE	ID	83352	AMF spaceholder
			LLOYD BROWN		3141 East 33 North Bear Island Drive	IDAHO FALLS	ID	83402	AMF spaceholder
		MAC HATCH CPA	ARTESIAN IRRIGATION, INC.		3024 N 46000 E	MURTAUGH	ID	83344	AMF spaceholder
			BUREAU OF INDIAN AFFAIRS (SHOSHONE BANNOCK)		PO BOX 220	Fort Hall	ID	83203-0220	AMF spaceholder
			BLACKFOOT IRRIGATION COMPANY		297 North 150 East	Blackfoot	ID	83221	AMF spaceholder
			BURGESS CANAL & IRRIGATION CO.		PO BOX 536	RIGBY	ID	83442	AMF spaceholder
	JOHN	LIND	BURLEY IRRIGATION DISTRICT		246 E 100 S ST	BURLEY	ID	83318	AMF spaceholder
	GARY	JACKSON	BUTTE AND MARKET LAKE CANAL CO.		589 N 2700 E	ROBERTS	ID	83444	AMF spaceholder
	RAY	CLEMENT	CLEMENT BROTHERS PRODUCE		425 S HOLMES AVE	IDAHO FALLS	ID	83403	AMF spaceholder
			CORBETT SLOUGH DITCH COMPANY		78 NORTH 100 WEST	Blackfoot	ID	83221	AMF spaceholder
	JOANN	DAYLEY	DILTS IRRIGATION CO., LTD.		504 NORTH 4200 EAST	RIGBY	ID	83442	AMF spaceholder
			ENTERPRISE CANAL CO., LTD.		PO BOX 583	RIRIE	ID	83443-0583	AMF spaceholder
			ENTERPRISE IRRIGATION DIST.		2626 EAST 100 NORTH	TETON	ID	83451-9802	AMF spaceholder
	SHAWN	SMITH	FALLS IRRIGATION DISTRICT		310 Valdez Street	AMERICAN FALLS	ID	83211-1561	AMF spaceholder

	STAN	HAWKINS	HARRISON CANAL AND IRRIGATION CO.	13520 North 55 East	IDAHO FALLS	ID	83401	AMF spaceholder
			HILLSDALE IRRIGATION DISTRICT	840 Valley Road South	HAZELTON	ID	83335	AMF spaceholder
	RICHARD	LOCKYAR	IDAHO IRRIGATION DISTRICT	496 E 14TH ST	IDAHO FALLS	ID	83404	AMF spaceholder
	DAVID	ZAYAS	IDAHO POWER COMPANY	PO BOX 70	BOISE	ID	83707-0070	AMF spaceholder
	NICKI	HAYES	LENROOT CANAL COMPANY	7227 SOUTH 1800 WEST	REXBURG	ID	83440-4533	AMF spaceholder
	WALT	MULLINS	MILNER IRRIGATION DISTRICT	5294 East 3610 North	MURTAUGH	ID	83344	AMF spaceholder
	DAN	DAVIDSON	MINIDOKA IRRIGATION DISTRICT	98 WEST 50 SOUTH	RUPERT	ID	83350-9128	AMF spaceholder
	KAIL	SHEPPARD	NEW SWEDEN IRRIGATION DISTRICT	2350 West 1700 South	IDAHO FALLS	ID	83402-4815	AMF spaceholder
	JOHN	BEUKERS	NORTH SIDE CANAL COMPANY, LTD.	921 N LINCOLN AVENUE	JEROME	ID	83338-1829	AMF spaceholder
	ANDREW	MICKLESON	OSGOOD CANAL COMPANY	2277 North 35th West	IDAHO FALLS	ID	83402	AMF spaceholder
	SHAWN	ELLIS	PEOPLES CANAL AND IRRIGATION CO.	1050 West Highway 39	Blackfoot	ID	83221	AMF spaceholder
	MIKE	HARRIGFELD	POPLAR IRRIGATION DISTRICT	2585 N AMMON ROAD	IDAHO FALLS	ID	83401	AMF spaceholder
	ALAN	SKAAR	PROGRESSIVE IRRIGATION DISTRICT	2585 N AMMON ROAD	IDAHO FALLS	ID	83401	AMF spaceholder
	ROD	ROBINSON	REID CANAL COMPANY	2697 W 6300 S	REXBURG	ID	83440	AMF spaceholder
	JUSTIN	PRICE	RUDY IRRIGATION CANAL COMPANY, LTD.	PO Box 376	RIGBY	ID	83442-0376	AMF spaceholder
			SALMON RIVER CANAL CO., LTD.	2700 Hwy 93	TWIN FALLS	ID	83301	AMF spaceholder
	STEVE	NIELSEN	SNAKE RIVER VALLEY IRRIGATION DISTRICT	PO BOX 70	BASALT	ID	83218	AMF spaceholder
			UNITED CANAL COMPANY	74 North 600 West	Blackfoot	ID	83221	AMF spaceholder
			WOODVILLE CANAL COMPANY	7475 South 35th West	IDAHO FALLS	ID	83402-5712	AMF spaceholder
Local Companies			Amalgamated Sugar	842 Pocatello Ave Suite 101	American Falls	ID	83211	
			Lamb Weston	2975 Lamb Weston Road	American Falls	ID	83211	
			Union Pactific Railroad	275 S Harrison Ave	Pocatello	ID	83204	
	Kevin	Inversen	Trans System	201 Canyon Crest Dr. W	Twin Falls	ID	83301	
			Stotz Equipment	2986 Frontage Road	American Falls	ID	83211	
			Pioneer Equipment	3102 ID-37	American Falls	ID	83211	
			Double M Ag & Irrigation	522 Lincoln St.	American Falls	ID	83211	
			Simplot Grower Solutions	2396 Pacific Road	American Falls	ID	83211	
			Northwest Farm Credit Service	73 Fort Hall Ave	American Falls	ID	83211	
			Valley Agromonics	2775 Neu Road	American Falls	ID	83211	
			Natural Resources Conservation	505 N OREGON TRAIL	American Falls	ID	83211	
	NORMAN	SEMANKO	PARSONS BEHLE & LATIMER	800 WEST MAIN STREET, STE 1300	BOISE	ID	83702	
			AMS inc.	105 Harrison St	American Falls	ID	83211	
Large Farming Entities	Lance	Funk	Lance Funk Farms	2765 Fairgrounds Rd	American Fallls	ID	83211	
			Driscoll Brothers	S. Oregon Trail	American Fallls	ID	83211	
			Koompin Farms	3010 Mckinley Road	American Falls	ID	83211	
			Wada Farms	337 S 1400 W	Pingree	ID	83262	

Return to Sender from 1035 North Lincoln, Jerome, ID 83338

Returned to Sender from P.O. Box 2831, Idaho Falls and 209 E. Main Street, Lewisville

208-562-4909

7-1596B (9-08)
Bureau of Reclamation

OFFICIAL FILE COPY		
DATE	SURNAME	CODE
11/19/18		1216
11/20/18	via email Newman	2000
11/20/18		1200
11/20		Acting 1000
		7115
Classification		
Project		
Control No.		
Folder I.D.		

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

NOV 2 1 2018

IN REPLY REFER TO:
SRA-1216
2.1.4.13

Subject: Request for Public Comments Regarding the Proposed Construction Activities for the Maintenance and Rehabilitation of the Spillway, Spillway Gate Operator Decks, Downstream Dam Face Concrete, and Stilling Basin Structures at American Falls Dam, Power County, Minidoka Project, Idaho

Dear Interested Party:

The Bureau of Reclamation is proposing to perform construction activities for the maintenance and rehabilitation of the spillway, spillway gate operator decks, downstream dam face concrete, and stilling basin structures at American Falls Dam, Power County, Idaho. The purpose of this letter is to inform interested and affected public of the proposal and to solicit comments pursuant to the National Environmental Policy Act of 1969. Enclosed is a Scoping Information Package describing the project proposal.

Scoping is a public involvement process used to determine the scope of issues to be addressed and identify issues related to a proposed action. Analysis of the proposal is ongoing and will be documented in an environmental assessment with an estimated completion in the summer of 2019. Comments received in response to this solicitation will be used to identify potential environmental issues related to the proposed action and to identify alternatives to the proposed action that meet the purpose of and need for the project.

Please help us identify important issues and concerns regarding the proposed action by providing your written comments. Although your comments are always welcome, they can be best used if received by **December 21, 2018**. Written comments may be submitted electronically to sra-nepa-comments@usbr.gov, or mailed or hand-delivered to:

Ms. Amy Goodrich
Natural Resources Specialist
Bureau of Reclamation Snake River Area Office
230 Collins Road
Boise, ID 83702

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in

your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

If you have additional questions about this proposal or its analysis, please contact Ms. Amy Goodrich, Natural Resources Specialist, at 208-383-2250.

Sincerely,

MELANIE PAQUIN

ACTING FOR Roland K. Springer
Area Manager

Enclosure

bc: SRA-1200 (Taylor), SRA-1208 (Jackson), USF-2000 (Newman), USF-3300 (Bliss), USF-1309 (Carson) (w/encl to each)

WBR:AGoodrich:KHennequin:11/19/2018:208-383-2250:SRA-1216
P:\NEPA\NEPA Projects\EA\American Falls Spillway\Scoping\Letters\PUBLIC\AMF_Spillway_Public Scoping Letter_20181119.docx

Identical letter sent to recipients on following pages.

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

NOV 2 1 2018

IN REPLY REFER TO:

SRA-1216
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Ms. Amy Goodrich
Natural Resources Specialist
Bureau of Reclamation Snake River Area Office
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Boise, ID 83702

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in

your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

If you have additional questions about this proposal or its analysis, please contact Ms. Amy Goodrich, Natural Resources Specialist, at 208-383-2250.

Sincerely,

ACTING FOR Roland K. Springer
Area Manager

Enclosure

7-1596B (9-08)
Bureau of Reclamation

OFFICIAL FILE COPY		
DATE	SURNAME	CODE
11/15	via email Godrich	1216
11/15	via email Newman	2000
11/15	[signature]	1200
11/16	[signature]	1000
		7115
Classification		
Project		
Control No.		
Folder I.D.		

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

IN REPLY REFER TO:

NOV 16 2018

SRA-1216
2.1.4.13

VIA FEDERAL EXPRESS

Honorable Theodore "Ted" Howard Fed Ex Tracking #773751340257
Tribal Chairman
Shoshone-Paiute Tribes
1623 Hospital Loop
Owyhee, NV 89832

Subject: Request for Comments Regarding the Proposed Construction Activities for the Maintenance and Rehabilitation of the Spillway, Spillway Gate Operator Decks, Downstream Dam Face Concrete, and Stilling Basin Structures at American Falls Dam, Power County, Minidoka Project, Idaho

Dear Chairman Howard:

The Bureau of Reclamation is proposing to perform construction activities for the maintenance and rehabilitation of the spillway, spillway gate operator decks, downstream dam face concrete, and stilling basin structures at American Falls Dam, Power County, Idaho. The purpose of this letter is to inform interested and affected Tribal public of the proposal and to solicit comments pursuant to the National Environmental Policy Act of 1969. Enclosed is a Scoping Information Package describing the project proposal.

Analysis of the proposal is ongoing and will be documented in an environmental assessment with an estimated completion in the summer of 2019. Comments received in response to this solicitation will be used to identify potential environmental issues related to the proposed action and to identify alternatives to the proposed action that meet the purpose of and need for the project.

Please help us identify important issues and concerns regarding the proposed action by providing your written comments. Although your comments are always welcome, they can be best used if received by **December 21, 2018**. Written comments may be submitted electronically to sra-nepa-comments@usbr.gov, or mailed or hand-delivered to:

Ms. Amy Goodrich
Natural Resources Specialist
Bureau of Reclamation Snake River Area Office
230 Collins Road
Boise, ID 83702

If you have additional questions about this proposal or its analysis, please contact Ms. Amy Goodrich, Natural Resources Specialist, at 208-383-2250.

Sincerely,

ROLAND K SPRINGER

Roland K. Springer
Area Manager

Enclosure

cc: Ms. Lynneil A. Brady Fed Ex Tracking # 773751343267
Acting Cultural Resources Director
Shoshone-Paiute Tribes
1623 Hospital Loop
Owyhee, NV 89832

Environmental Director Fed Ex Tracking #773751349909
Tribal Headquarters
Shoshone-Paiute Tribes
1623 Hospital Loop
Owyhee, NV 89832
(w/encl to each)

bc: SRA-1200 (Taylor), SRA-1208 (Jackson), USF-2000 (Newman), USF-3300 (Bliss), USF-1309 (Carson) (w/encl to each)

WBR:AGoodrich:KHennequin:11/15/2018:208-383-2250:SRA-1214
P:\NEPA\NEPA Projects\EA\American Falls Spillway\Scoping\Letters\TRIBAL\SHOPAI_TRANSMITTAL_AMF_Spillway_Scoping Letter_20181106.docx

Identical Letter Sent To:

Honorable Nathan Small Fed Ex Tracking # 773751325452
Chairman, Fort Hall Business Council
Shoshone-Bannock Tribes
85 W. Agency Rd., Building #82
Fort Hall, ID 83203

cc: See next page.

cc: Mr. Cleve Davis Fed Ex Tracking # 773751329789
Environmental Program Manager
Shoshone-Bannock Tribes
85 W. Agency Rd., Building #82
Fort Hall, ID 83203

Mr. Chad Colter Fed Ex Tracking # 773751333391
Fish and Wildlife Director
Shoshone-Bannock Tribes
85 W. Agency Rd., Building #82
Fort Hall, ID 83203
(w/encl to each)

Scoping Information Package

Proposal to Perform Construction Activities for the Maintenance and Rehabilitation of the Spillway, Spillway Gate Operator Decks, Downstream Dam Face Concrete, and Stilling Basin Structures at American Falls Dam, Power County, Idaho

This information package summarizes the proposal from the Bureau of Reclamation (Reclamation) to perform construction activities necessary for the maintenance and rehabilitation of the spillway, spillway gate operator decks, and stilling basin structures at American Falls Dam. This project would consist of the cutting, removal, and replacement of existing damaged concrete and reinforcing, and replacement or modification of an existing drain grate. This project would address the need for the replacement and repair of concrete on these dam structure components which has cracked, spalled, and otherwise deteriorated over 40 years in service. These components require repair before further deterioration compromises the integrity of the dam.

Federal actions must be analyzed in accordance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations to determine potential environmental consequences. Reclamation is asking for comment to better identify issues and concerns associated with this proposal further detailed below.

Background

American Falls Dam is a 94-foot-high composite concrete and earth gravity-type dam on river mile 714.7 of the Snake River near American Falls, Idaho. The dam itself is located in Power County, Idaho, but the reservoir stretches northeast into both Bingham and Bannock Counties (see attached map). American Falls Dam and Reservoir comprise a multipurpose facility from which the principle benefits include irrigation, power generation (through a powerplant owned and operated by Idaho Power), flood control, fish and wildlife resources, and recreation.

A core-drilling program in the early 1960s revealed that the concrete in portions of the dam was in a relatively advanced stage of deterioration due to a chemical reaction between alkalis in the cement and the aggregate. This type of reaction, unknown at the time of construction, resulted in a significant loss in strength and durability, threatening the competence of the dam and reducing the allowable storage of the reservoir to about 66 percent of its maximum design capacity. By the Congressional Act of December 28, 1973, the American Falls Reservoir District (District), acting as the constructing agency representing the storage spaceholders, was authorized to finance and contract for the replacement of American Falls Dam which was completed in 1978, and the

original structure was demolished. Reclamation repaid the District, acquired title, and assumed responsibility for operations and maintenance after completion of the dam.

Existing Condition and Need for Action

The concrete on components of the current American Falls Dam structure is exhibiting significant deterioration, cracking, and spalling after 40 years in service and requires repairs. Over time, portions of the concrete on the downstream spillway face, spillway gate operator decks, adits (access entryways), downstream dam face concrete, and stilling basin floor structures have become cracked and damaged. Minor repairs have been completed to the spillway face throughout its lifetime, including an overlay of the stilling basin floor that was completed in 1978 to repair damaged concrete after the initial spill season. However, over the ensuing 40 years of service, these structures have undergone ongoing deterioration. This creates the current need for action.

A Value Engineering Study was completed in 2015 which recommended the following corrective actions: removal and replacement of 6 inches of concrete on the spillway face and stilling basin floor; repair of concrete on the upper spillway gate operator decks (referred to as "pier decks" in these recommendations); and complete replacement of the spillway adits. The deteriorated concrete needs to be repaired or replaced before further degradation compromises the integrity of the dam structure.

Decision to be made – Through the process of an environmental assessment (EA), Reclamation will determine whether the proposed project would significantly affect the quality of the human environment and thereby require the preparation of an Environmental Impact Statement, and if not, whether the project qualifies for a Finding of No Significant Impact. Reclamation will then determine whether to do one of the following:

- Approve the proposed project
- Deny the proposed project
- Accept the proposed project with minor changes

Proposed Action

Reclamation proposes to contract for the construction activities necessary to (1) cut, remove, and replace existing damaged concrete and reinforcing on the spillway, spillway gate operator decks, downstream dam face concrete, and stilling basin structures; and (2) replace or modify an existing drain grate to facilitate future access for maintenance. These maintenance and rehabilitation activities would include the hydroblasting and saw cutting, removal, and offsite disposal of existing deteriorated concrete, repair or replacement of deteriorated concrete, removal and replacement of damaged reinforcing where it is encountered, replacing or modifying an existing drain grate to provide a removable section to facilitate access for

maintenance, traffic control for the periods of highway closure necessary to facilitate this work, and implementation of monitoring and mitigation measures to ensure that all downstream water quality standards put forth by the Idaho Department of Environmental Quality (IDEQ) are maintained throughout the operation.

The major construction components of the proposed action are:

- **Stilling basin floor concrete removal/repair**: A 4-inch thick epoxy bonded overlay plus an additional 2 inches of original concrete below the overlay would be removed. The removed concrete would be replaced with a 6-inch overlay and single mat of reinforcing doweled into the existing concrete.
- **Spillway face concrete removal/repair**: Approximately 6 inches of concrete on the spillway face would be removed to expose sound concrete. The removed concrete would be replaced with a 6-inch lift of replacement concrete.
- **Gallery adit replacement**: The adits located on the east and west sides of the spillway would be removed and replaced. It is anticipated this will require complete removal and replacement of the adit concrete from the downstream face of the dam outward.
- **Spillway gate operator deck repair**: Repair of deteriorated concrete on the edges of all spillway gate operator decks would be performed.
- **Downstream dam face concrete repair**: Localized repair of cracked and damaged concrete on both the left and right downstream faces of the dam would be performed.
- **Drain grate replacement**: The existing drain grate would be removed and replaced or modified to provide a removable section to facilitate future access for maintenance.

Specific construction methods used to accomplish each of these tasks will be proposed by the contract awardee and subject to approval by Reclamation. Compliance with industry best practices would be required of the contract awardee.

This work would occur in two separate years, within proposed construction windows from May 1 to October 31 in both 2020 and 2021. The portions of the proposed construction work taking place within the waterway would require a lockout and complete dewatering of the spillway and stilling basin. This work would begin on or after August 1, 2020, and cease by October 31, 2020; work would resume the following year beginning on or after August 1, 2021, and would cease by October 31, 2021. Limiting construction in the waterway to this timeframe would enable Reclamation to continue to fulfill downstream water demands through the irrigation season and allow for resumed spillway use in the non-irrigation season, when Idaho Power's powerplant is typically offline and water is typically discharged through the spillway and stilling basin. During the timeframes when the spillway and stilling basin must remain dewatered, all water releases would be passed through the powerplant. Work would occur in the waterway for an estimated maximum of 152 days within the two-year duration of this project.

During work in the waterway, westbound SH-39 (Aberdeen Highway) where it crosses the dam would be closed, and all traffic rerouted to eastbound SH-39 under coordination with the Idaho Transportation Department (ITD). These traffic control restrictions would be in place for an estimated 113–130 days within the two-year duration of this project.

Preliminary Alternative Development

The EA will include consideration of the Proposed Action Alternative and a No Action Alternative. The No Action Alternative would include Reclamation's continued operation of American Falls Dam in its present condition. Under the No Action Alternative, the proposed maintenance and rehabilitation construction activities would not occur, and the American Falls Dam structure would continue operation with ongoing deterioration of the concrete components in place. Additional alternatives may be developed, dependent upon the issues identified throughout the NEPA process.

Project Considerations

The following known issues of potential concern will receive particular analysis in the EA:

- **Downstream water quality**: Monitoring and mitigation measures to address the potential for low downstream levels of dissolved oxygen when the spillway cannot be used would be developed by Reclamation biologists and water quality specialists, in cooperation with the IDEQ, Idaho Power, and the Idaho Department of Fish and Game.

- **Traffic restrictions**: Coordination with the ITD and local transportation coalitions would be ongoing throughout project planning and execution.

- **Downstream Water Delivery**: Typical water releases to meet irrigation demand downstream to Milner Dam, salmon flow augmentation commitments, or flood control space requirements would be maintained throughout the duration of the proposed project. A multi-facility operating strategy to ensure downstream water delivery demands are met would be developed by Reclamation in coordination with Idaho Power.

- **Flood Management**: A water management plan would be developed to ensure appropriate flood control capabilities are maintained throughout the duration of the project.

Attachment: The proposed project location map with project area detail is on the following page.

American Falls Dam - Proposed Project Area

RECLAMATION
Managing Water in the West

American Falls Dam - Proposed Project Location

0 0.1 mi

N

This map is provided as-is and may contain representations of property boundaries. It is intended for general reference only. None of the parties involved in preparing this map or data contained herein warrant or represent information to be complete and accurate, and cannot be held responsible for errors or omissions.

Map created by: Middle Snake Field Office
Date: 11/5/2018

November 29,2018

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OWYHEE, NV 89832 US

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Boise, ID 83702 US

Reference Goodrich - AF Spillway Scoping

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Recipient:
Lynneil A. Brady
Shoshone-Paiute Tribes
1623 HOSPITAL LOOP
OWYHEE, NV 89832 US

Shipper:
Katy Hennequin
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Boise, ID 83702 US

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Shipping Information:

Tracking number:	773751349909	**Ship date:**	Nov 16, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Environmental Director
Shoshone-Paiute Tribes
1623 HOSPITAL LOOP
OWYHEE, NV 89832 US

Shipper:
Katy Hennequin
230 Collins Road
Boise, ID 83702 US

Reference Goodrich - AF Spillway Scoping

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Shipping Information:

Tracking number:	773751325452	**Ship date:**	Nov 16, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Honorable Nathan Small
Shoshone-Bannock Tribes
85 W. Agency Road
Building #82
FORT HALL, ID 83203 US

Shipper:
Katy Hennequin
230 Collins Road
Boise, ID 83702 US

Reference Goodrich - AF Spillway Scoping

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November 29,2018

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Shipping Information:

Tracking number:	773751329789	**Ship date:**	Nov 16, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Mr. Cleve Davis
Shoshone-Bannock Tribes
1 Pima Drive
FORT HALL, ID 83203 US

Shipper:
Katy Hennequin
230 Collins Road
Boise, ID 83702 US

Reference Goodrich - AF Spillway Scoping

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November 29,2018

Dear Customer:

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Shipping Information:

Tracking number:	773751333391	**Ship date:**	Nov 16, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Mr. Chad Colter
Shoshone-Bannock Tribes
85 W. Agency Rd.
Building #82
FORT HALL, ID 83203 US

Shipper:
Katy Hennequin
230 Collins Road
Boise, ID 83702 US

Reference Goodrich - AF Spillway Scoping

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APPENDIX I

Idaho Fish and Game Comments on Draft Environmental Assessment

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IDAHO DEPARTMENT OF FISH AND GAME
SOUTHEAST REGION
1345 Barton Road
Pocatello, Idaho 83204

Brad Little / Governor
Ed Schriever / Director

April 12, 2019

Amy Goodrich
Bureau of Reclamation, Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702

Dear Ms. Goodrich,

Re: Draft Environmental Assessment for Maintenance and Rehabilitation of Spillway and Dam Structures at American Falls Dam

Idaho Department of Fish and Game (Department) has reviewed the draft Environmental Assessment (draft EA) submitted by the Bureau of Reclamation (BOR) for maintenance and rehabilitation of spillway and dam structures at American Falls Dam in Power County, Idaho. It is our understanding that the BOR is proposing maintenance and rehabilitation construction activities to cut, remove, and replace existing damaged concrete and reinforcing on the spillway, spillway gate operating decks, downstream dam face concrete, and stilling basin structures, and replacement or modification of the existing drain grate at American Falls Dam. The construction activities will limit the options available for releasing water for the purpose of maintaining minimum standards for Dissolved Oxygen in the Snake River below American Falls Dam. The Department understands the necessity of the proposed action to maintain the integrity of structures at American Falls Dam and we appreciate the collaboration between the Department, Idaho Department of Environmental Quality, and BOR in developing the draft EA.

The purpose of these comments is to assist you by providing technical information addressing potential effects to wildlife, fisheries, and habitats; and how any adverse effects might be avoided, minimized, or mitigated. It is not the intention of the Department to support or oppose the proposed action. Resident species of fish and wildlife are property of all Idaho citizens. The Department and the Idaho Fish and Game Commission are expressly charged with statutory responsibility to preserve, protect, perpetuate and manage all fish and wildlife in Idaho (Idaho Code36-103(a)). In fulfillment of our statutory charge and direction as provided by the Idaho Legislature, we offer the following comments and recommendations for inclusion in the final Environmental Assessment.

Project success, with minimal impacts to wildlife, fisheries, and habitats, will be largely contingent on abiotic conditions and the resulting water year. It is our understanding that BOR is targeting a reservoir volume of 30% of full pool by the beginning of the in-waterway construction window, August 1, 2020 and 2021 and will maintain a reservoir volume of at least 15% of full pool by the end of the construction window, November 23, 2020 and 2021. We recommend BOR adhere to these targeted volumes as closely as is feasible to ensure a beneficial amount of fish entrainment through the dam, as well as to meet water quality standards for aquatic organisms below the dam. We encourage BOR to be adaptive in water management during the implementation of this project; the Department would have serious concerns over impacts to fish populations if reservoir volume dips below 15% of full pool in August for reasons already specified in the draft EA.

Department staff have been committed to assisting the BOR with the planning of this proposed action and we look forward to continued collaboration. Thank you for the opportunity to provide comment. Please contact Arnie Brimmer, Regional Fishery Biologist, or Becky Abel, Environmental Staff Biologist, in the Southeast Regional Office (208-232-4703) if you have any questions.

Sincerely,

Dan Garren
Regional Supervisor
Southeast Region