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Attorneys for Northern Utah County Water Conservancy District

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**BEFORE THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY**

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In the Matter of :  
NORTH UTAH COUNTY WATER  
CONSERVANCY DISTRICT

Notice of Violation and Compliance Order

Docket No. 116-07

NORTH UTAH COUNTY WATER  
CONSERVANCY DISTRICT'S  
REQUEST FOR AGENCY ACTION

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Pursuant to Utah Code Ann. § 19-1-301, Utah Code Ann. § 63G-4-201(3)(a) and (b) and Utah Admin. Code R305-7-303, the North Utah County Water Conservancy District (“NUCWCD”) hereby files this Request for Agency Action before the Utah Department of Environmental Quality regarding the Notice of Violation and Compliance Order (“NOV/CO”) in Docket No. 116-07 issued by the Director of the Utah Division of Water Quality (“UDWQ”) on September 28, 2016. NUCWCD seeks review of the NOV/CO issued on September 28, 2016. In addition, NUCWCD responds to Section E of the CO herein.

**I. AGENCY’S FILE NUMBER AND DATE OF MAILING**

NUCWCD contests certain aspects of the NOV/CO signed by the Director of UDWQ in Docket No. 116-07 on September 28, 2016. This Request for Agency Action is timely submitted

to UDWQ as it is within 30 days after issuance of the NOV/CO as required by Utah Admin. Code R305-7-303 and served in accordance to Utah Admin. Code R305-7-104 as shown on the attached service list.

**II. STATEMENT OF LEGAL AUTHORITY AND JURISDICTION**

NUCWCD brings this Request for Agency Action pursuant to Utah Code Ann. § 19-1-301. The Request for Agency Action meets the requirements of Utah Code Ann. § 63G-4-201(3)(a) and (b) and Utah Admin. Code R305-7-303, which specify the content of the Request for Agency Action. The Utah Department of Environmental Quality has the legal authority and jurisdiction to review this matter as a non-permit review adjudicative proceeding pursuant to Utah Code Ann. § 19-1-301.

**III. STATEMENT OF FACTS AND REASONS**

1. NUCWCD is a water conservancy district organized under the laws of the State of Utah and headquartered in American Fork, Utah.
2. NUCWCD owns and operates the Tibble Fork Dam located below the confluence of Deer Creek and North Fork American Fork River in American Fork Canyon, Utah County, Utah.
3. In connection with the project to bring the Tibble Fork Dam into compliance with current State and Federal Dam Safety standards including installation of an upstream guard gate for the intake structure and an upstream cutoff wall, the NUCWCD was required to drain Tibble Fork Reservoir.
4. As part of the effort to upgrade the Tibble Fork Dam, an Environmental Assessment was performed with the lead federal agency being Natural Resources Conservation Service, United States Department of Agriculture (“NRCS”). The

Forest Service, United States Department of Agriculture (“USFS”) was a formal cooperating agency for development of the Environmental Assessment.

5. The Environmental Assessment was reviewed by various agencies including NRCS, USFS, Army Corp. of Engineers, the US National Park Service, and the Utah Division of Wildlife Resources (“DWR”).
6. Multiple Local, State and Federal agencies were aware that NUCWCD planned to release water from the Tibble Fork Reservoir to facilitate the dam reconstruction.
7. Although there were issues associated with draining the Tibble Fork Reservoir, additional review of sampling data is necessary to ascertain the impact of water releases in the time frame of the NOV/CO. For example, in the UDEQ’s “Evaluation of UDEQ Water Quality Data following the Tibble Fork Reservoir Sediment Release” dated September 9, 2016, the Executive Summary includes the following bullet points:
  - Concentrations of dissolved metals in water quality samples collected above and below Tibble Fork Reservoir on August 22, 2016 do not violate Utah’s water quality standards for aquatic life or agricultural exposures.
  - Concentrations of total metals in the water column collected on August 22 through August 28 below Tibble Fork Reservoir do not exceed human health screening values for recreational exposures.
  - At the request of local city governments, water samples were taken from Highland Glen Reservoir, Heritage Park, and Manila Reservoir on August 31, 2016. These recreation sites are downstream from the canyon and are all fed by irrigation water drawn from the American Fork Creek. Analysis of total and dissolved metals in the samples confirmed the levels do not exceed the EPA screening standards for recreational use, agriculture, or aquatic life.
8. Regarding the Compliance Order E1, NUCWCD has taken action to be in compliance with all applicable provisions of the Utah Water Quality Act and

Water Quality Rules in the Utah Admin. Code R317, as set forth in Paragraph 10 below.

9. Regarding the Compliance Order E2, NUCWCD is not allowing unpermitted releases of sediment at the site which violate Utah Water Quality standards.
10. Regarding the Compliance Order E3A, NUCWCD states as follows:

- **Dates of initial sediment release from the reservoir.**

Draining of the Tibble Fork Reservoir began on Wednesday night, August 17, 2016. On Thursday afternoon, August 18, 2016, the NUCWCD discussed draining of the Tibble Fork Reservoir in the monthly Board Meeting. Due to the need to regulate downstream irrigation flow and previous experience with draining water from the Tibble Fork Reservoir while working with DWR to minimize the effect on aquatic life, NUCWCD continued operational releases through the outlet conduit during draining. DWR and NRCS representatives were in attendance at NUCWCD's Board Meeting. NRCS stated that they would publish notice that water flowing downstream of the Tibble Fork Reservoir would appear muddy for at least 48 hours. This notice was published by NRCS and the U.S. National Park Service at Timpanogos Cave was notified on Friday, August 19, 2016.

The draining of Tibble Fork Reservoir went as planned Friday through Monday morning August 19 through 22, 2016 with the gate partially opened such that the flow would not exceed 40 cfs. Sunday, August 21, 2016, it was observed that the flow in the river downstream of

the Tibble Fork Reservoir was muddy, as expected. On Monday morning, August 22, 2016, the outlet gate plugged and the Water Master opened the gate to release the plug. The regulation of water in the Tibble Fork Reservoir is challenging and usually requires only minor adjustments of the outlet gate. While opening the gate successfully released the plug, an unexpected surge of sediment was released from the Tibble Fork Reservoir with the flow unexpectedly increasing up to 60 cfs. This condition was observed late Monday morning. The Water Master was contacted and lowered the gate early afternoon to allow the water to pond between elevation 6360 ft and 6365 ft. The flow entering the river downstream of the dam began to clear.

The bypass channel was completed and the river was diverted into the bypass on Sunday night, August 28, 2016. Photographs of the completed bypass channel are attached hereto and incorporated by reference herein.

- **How long sediment was released from the reservoir during each occurrence.**

While minor quantities of sediment were released beginning Friday, August 19, 2016 and increasing through Monday morning, August 22, 2016, the unexpected release of heavy sediment load began on Monday morning, August 22, 2016, and continued until Monday afternoon, August 22, 2016. Minor quantities of sediment were released until the bypass channel was in operation on Sunday, August 28, 2016, as discussed below.

- **An estimation of the volume and quality of sediment released from the reservoir during each occurrence.**

An estimate of saturated sediment removal was determined based on the November 2015 bathymetric survey compared to the aerial survey on August 25, 2016. The estimated quantity was 8568 cu. yds., which is about 5.5% of the total sediment quantity. The AMEC report (2010) reports a moisture content of the sediments at 40%, resulting in 60% solids (about 5141 cu. yds). A major portion of the sediment is expected to be captured in two (2) irrigation impoundments and one (1) debris basin located at the mouth of the canyon.

11. Regarding the Compliance Order E3B, NUCWCD states as follows:

**B. Describe, in detail, the actions taken and/or planned to be implemented (including dates), to attain and continue to be in full compliance with this NOV/CO.**

Upon discovery of the unexpected surge of sediment released into the American Fork River on Monday morning, August 22, 2016, the outlet control gate was partially closed to allow water to pond in the Tibble Fork Reservoir, substantially reducing the sediment load. Subsequent to an on-site meeting with various regulatory agencies on Tuesday, August 23, 2016, a bypass diversion plan was designed and drawings prepared to divert around sediment in the Tibble Fork Reservoir basin and into the Deer Creek channel just upstream of where the outlet intake structure is located.

The plan was approved by regulatory agencies during an on-site meeting held at 1:30 pm on Wednesday, August 24, 2016. Construction of the bypass channel began immediately following the meeting. The bypass channel was

completed and water diverted into the channel on Sunday, August 28, 2016.

NUCWCD paid the contractor, Whitaker Construction, \$30,799 to construct the bypass channel. Photographs of the completed bypass channel are attached hereto and incorporated by reference herein.

The owner provided 24 hour watch of the flow, adjusting the gate opening as needed to maintain clear flow through the Labor Day weekend. The pool in the Tibble Fork Reservoir was maintained between about elevation 6366 and 6368 ft., typically requiring minor gate adjustments (less than ½ inch).

The owner has been monitoring and plans to continue monitoring the flow and pool level until the new outlet works (to be located above the sediment level in the Tibble Fork Reservoir) is installed and operational – est. November, 2016.

12. Regarding the Compliance Order E3C, NUCWCD states as follows:

**C. Describe, in detail, any environmental mitigation plans for the construction that were in place prior to the initial release on August 19, 2016 and any deviations from that plan.**

The Contract Documents require the Contractor to comply with the Federal Water Pollution Control Act and State and Federal permits including the Stream Alteration Permit and the Corps of Engineers 404 Permit which incorporates the 401 Permit. On August 22, 2016, in an effort to meet contractual obligations to deliver water downstream, a plug of sediment was accidentally released.

13. Regarding the Compliance Order E3D, NUCWCD states as follows:

**D. Provide a written explanation as to why no federal, state, or local agencies were notified of the sediment release until August 21, 2016, two days after it had connected.**

During the NUCWCD board meeting on Thursday, August 18, 2016, draining of the Tibble Fork Reservoir resulting in excessive turbidity (muddy water) was discussed with the State DWR representative and NRCS in attendance. Notice of a muddy stream was posted on the Tibble Fork Website on Friday, August 19, 2016, and the National Park Service was notified. Excessive sediment release occurred on Monday, August 22, 2016.

14. Regarding the Compliance Order E3E, NUCWCD states as follows:

**E. Describe how the polluted excess sediment will be removed from the affected portions of the American Fork River drainage, and what steps will be taken to rehabilitate wildlife habitat in the creek and protect public health from any contaminated canals, including timeframes.**

Samples of the Tibble Fork Reservoir sediment were tested in 2011 using the Toxicity Characteristics Leaching Procedure (TCLP) Limit from the EPA TCLP and Characteristic Wastes (D-Codes) website. The final geology report prepared by the NRCS, July 24, 2015, states: “The SPLP results showed no elements above the U.S. EPA Primary MCLs or Secondary MCLs limits. The TCLP results show that all TCLP analyses are below the Hazardous Waste Limit. Therefore, the sediment in the Tibble Fork Reservoir does not need to be treated as hazardous waste, however, the sediment is still contaminated and should be handled following state and federal guidelines.”

Flow from the American Fork River enters two (2) irrigation impoundments and one (1) debris basin near the mouth of the canyon where sediment is deposited. The river is currently flowing less than 20 cfs. It is anticipated that sediment will be removed from the American Fork River during spring runoff where flow typically increases to over 200 cfs. Several truck loads

of sediment are cleaned from the two (2) irrigation impoundments and one (1) debris basin on a yearly basis. To ensure that any sediments classifying as “hazardous waste” are properly disposed of, the NUCWCD plans to have a state certified soil and groundwater sampler obtain samples of the sediment at three (3) random locations in each basin with samples obtained at two (2) depths at each location. The samples will be delivered to a certified laboratory for testing of heavy metals and TCLP to determine if the sediment should be treated as hazardous waste.

15. Regarding the Compliance Order E3F, NUCWCD states as follows:

**Prepare a comprehensive monitoring plan for Director approval ...**

NUCWCD will approve a subcontract to include an aquatics specialty consultant with SWCA Environmental to prepare a Comprehensive Monitoring Plan. A Conceptual Monitoring Plan, dated October 11, 2016 has been prepared by SWCA and is attached hereto. The plan further addresses the items in paragraph E as well as paragraph F including:

**Objective 1: Evaluate the Impacts to Aquatic Organisms**

Task 1a. Monitor and evaluate changes in the fish population and composition as a result of the release.

Task 1b. Monitor and evaluate changes in the macroinvertebrate population and composition as a result of the release.

Task 1c. Perform a long-term evaluation of fish tissue metal accumulation.

**Objective 2: Monitor Cleanup Status**

Task 2a. Conduct cross sections of the stream to evaluate changes in geomorphology and sediment.

Task 2b. Integrate fish monitoring data into an evaluation of the status of the fish populations.

Task 2c. Integrate macroinvertebrate monitoring data into an evaluation of the status of the macroinvertebrate populations.

Objective 3: Demonstrate that Sediment Conditions are not Harmful to Public Health

Task 3a. Integrate sediment data to demonstrate that public health is not harmed following restoration efforts.

Objective 4: Demonstrate that Irrigation and Secondary Water Use is Not Negatively Impacted.

Task 4a. Integrate water quality data to demonstrate that irrigation and secondary water use is not negatively impacted following restoration efforts.

#### IV. **REQUEST FOR RELIEF**

Based upon the foregoing, NUCWCD respectfully requests that the NOV/CO be modified to account for facts as stated herein and to recognize the significant actions taken by NUCWCD to remedy any environmental issues associated with the draining of the Tibble Fork Reservoir.

Respectfully submitted this 27<sup>th</sup> day of October, 2016.

  
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John Jacobs  
Brian W. Burnett  
Attorneys for North Utah County Water  
Conservancy District

**CERTIFICATE OF SERVICE**

The undersigned caused the foregoing Request for Agency Action to be emailed this 27<sup>th</sup> day of October, 2016 to the following:

Walter L. Baker, P.E.  
Director  
Utah Division of Water Quality  
[wbaker@utah.gov](mailto:wbaker@utah.gov)

Kevin Okleberry  
Utah Division of Water Quality  
[kokleberry@utah.gov](mailto:kokleberry@utah.gov)

Administrative Proceedings Records Officer  
[DEQAPRO@utah.gov](mailto:DEQAPRO@utah.gov)

Craig Anderson  
Assistant Attorney General  
[craiganderson@utah.gov](mailto:craiganderson@utah.gov)

The undersigned also caused the foregoing Request for Agency Action to be hand delivered this 27<sup>th</sup> day of October, 2016 to:

Utah Department of Environmental Quality  
195 North 1950 West  
Salt Lake City, UT 84116

Walter L. Baker, P.E.  
Utah Division of Water Quality  
195 North 1950 West  
Salt Lake City, UT 84116

Craig Anderson  
Assistant Attorney General  
195 North 1950 West  
Salt Lake City, UT 84116

  
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Brian W. Burnett







October 11, 2016

Mr. Rex V. Harrison, Executive Vice President  
HORROCKS ENGINEERS  
2162 W. Grove Parkway  
Suite 400  
Pleasant Grove, Utah 84062

Dear Mr. Harrison:

Attached as requested is a Conceptual Monitoring Plan and cost estimate for preparing a Comprehensive Monitoring Plan for the Tibble Fork Dam sediment discharge. This conceptual plan was written in lieu of a comprehensive monitoring plan, as requested by the Utah Division of Water Quality (UDWQ). It is not possible to develop the Comprehensive Monitoring Plan, because of the short time period remaining in the 30-day time frame starting September 28, 2016. We recommend the attached Conceptual Plan be considered by the UDWQ with the understanding that a more detailed comprehensive monitoring plan will be delivered by January 6, 2017.

It is hoped and anticipated that the UDWQ will evaluate the attached conceptual monitoring plan and provide comments, suggestions, and recommendations that will help to refine and improve the final plan. SWCA will incorporate UDWQ comments into the comprehensive monitoring plan and submit draft and final versions.

Please contact Dr. Richard Valdez at (801) 752-9606 or me at (505) 254-1115 if you have any questions or need additional information.

Sincerely,



Brian J. Bader  
SW Region Water Resources Director

cc: Dr. Richard Valdez

## Tibble Fork Dam Sediment Discharge Conceptual Monitoring Plan

This document describes a Conceptual Monitoring Plan to evaluate the effects of the Tibble Fork Dam sediment discharge and the effects of restoration efforts on aquatic life, and agricultural, and recreational beneficial uses for the American Fork River. It is not possible to develop a Comprehensive Monitoring Plan in the 30-day time period requested by the Utah Division of Water Quality (UDWQ), and it is recommended that this conceptual plan be considered with the understanding that a more detailed comprehensive plan will be delivered to the UDWQ by January 6, 2017.

### Introduction

A Notice of Violation and Compliance Order (NOV/CO) was issued to North Utah County Water Conservancy District (NUCWCD) on September 28, 2016, by the UDWQ for the Tibble Fork Dam sediment discharge. Under the subject Order, the NUCWCD is hereby ordered to submit a report containing six written explanations or descriptions of information pertaining to the discharge within thirty (30) days of receipt of the NOV/CO.

One of the six requirements of the NOV/CO is to prepare a comprehensive monitoring plan for the sediment and water in the affected portions of the American Fork River drainage, including the frequency, duration, and specific analyses that will be conducted. The monitoring plan must be sufficient to demonstrate full extent of impacts to the aquatic life, agricultural, and recreational beneficial uses described in R317-2-13.5(c) and to demonstrate effectiveness of restoration efforts for these uses, and should include the following:

- An evaluation of the impacts to aquatic organisms; for example, changes to fish and macroinvertebrate population and composition as a result of the release, and long-term evaluation of fish tissue metal accumulation.
- Monitoring of cleanup status to include a demonstration that substrate and aquatic populations have returned to pre-release condition through the impacted segments of the river.
- Demonstration that sediment conditions are not harmful to the public health.
- Monitoring to demonstrate irrigation and secondary water use is not negatively impacted.

A detailed and comprehensive monitoring plan, as described above, will need to be prepared in cooperation and coordination with the NUCWCD, UDWQ, Utah Division of Wildlife Resources (UDWR), U.S. Army Corps of Engineers, U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service, as well as other interested and affected parties. The level of detail required in such a plan, arrangement of logistical services and support, and required scientific collecting permits will require more than 30 days to assemble. This document provides a Conceptual Monitoring Plan that addresses the four bullet items above, as requested of the plan in the NOV/CO and will form the basis for the Comprehensive Monitoring Plan.

## Objectives and Tasks

### Objective 1: Evaluate the Impacts to Aquatic Organisms

*Task 1a. Monitor and evaluate changes in the fish population and composition as a result of the release.*

Electrofishing surveys will be done in coordination with the Utah Division of Wildlife Resources (UDWR) in a representative reach of stream at each of the six sample locations identified below. A depletion estimator may be conducted periodically to estimate the number of fish in each reach sampled; this sampling strategy requires at least three repeated passes or collections through the same area. Fish will be identified to species, weighed and measured, and released. The number of fish will be expressed as number of fish per hour of electrofishing, or as total number of fish in the reach. Select individuals may be euthanized and preserved appropriately for tissue analysis.

*Task 1b. Monitor and evaluate changes in the macroinvertebrate population and composition as a result of the release.*

Six benthic macroinvertebrate samples will be taken at each of the six sampling locations. Samples will be collected with an Ekman type sampler that encloses a specified area of stream bottom and allows for all invertebrates in that area to be retained in a collector net. Each sample will be appropriately preserved in ethanol, placed in a labeled container, and returned to a laboratory for sorting and identification of organisms. Macroinvertebrate density will be expressed as number of taxa per square meter of stream bed.

*Task 1c. Perform a long-term evaluation of fish tissue metal accumulation.*

A select number of fish will be sacrificed at each collection period from each of the six sample locations for tissue analysis. The fish will be appropriately preserved in the field and forwarded to a laboratory for concentrations of arsenic, cadmium, lead, zinc, and mercury in muscle and liver tissues. This analysis will continue through the duration of the monitoring.

### Objective 2: Monitor Cleanup Status

*Task 2a. Conduct cross sections of the stream to evaluate changes in geomorphology and sediment.*

At least five cross sections will be measured at each of the six sample locations. Water depth, velocity, and substrate type will be recorded at each cross section in order to characterize the shape of the channel and the amount of sediment remaining at each location. Permanent pins will be established for each cross section and the elevations and locations of all pins at each location will be linked in order to develop two-dimensional profiles of the stream channel.

*Task 2b. Integrate fish monitoring data into an evaluation of the status of the fish populations.*

The fish monitoring data collected from this effort, as well as any prior data collected by the UDWR, will be assimilated and integrated into an assessment of the populations of the two major recreational fish species, including brown trout and rainbow trout. Time series analysis and stock assessment will be done to evaluate the status of the fish populations in response to restoration efforts.

*Task 2c. Integrate macroinvertebrate monitoring data into an evaluation of the status of the macroinvertebrate populations.*

The macroinvertebrate monitoring data collected from this effort, as well as any prior data collected by the UDWR and UDWQ, will be assimilated and integrated into an assessment of the benthic macroinvertebrate population. Time series analysis of density will be done to evaluate the status of the macroinvertebrate population in response to restoration efforts.

Objective 3: Demonstrate that Sediment Conditions are not Harmful to Public Health

*Task 3a. Integrate sediment data to demonstrate that public health is not harmed following restoration efforts.*

The sediment monitoring data collected from this effort, as well as any prior data collected, will be assimilated and integrated into an assessment of sediment deposits in the American Fork River. Time series analysis will be done to evaluate the status of the sediment in response to restoration efforts.

Objective 4: Demonstrate that Irrigation and Secondary Water Use is Not Negatively Impacted.

*Task 4a. Integrate water quality data to demonstrate that irrigation and secondary water use is not negatively impacted following restoration efforts.*

Data on water quality, sediment, macroinvertebrates, fish, and fish tissue will be assimilated and compared to EPA and State water quality standards to determine if irrigation and secondary water use is negatively impacts.

### Sample Locations

Samples will be taken at the following locations on the American Fork River. These sample locations are upstream and downstream of Tibble Fork Reservoir and approximately correspond to the six sample locations used by the UDWR in their August 23, 2016 survey (indicated by "\*\*\*").

1. Upstream of Tibble Fork Reservoir, above the high pool level,
2. Mile Rock Campground, ¾ mile downstream of Tibble Fork Dam,
3. \*\*First picnic site above South Fork and North Fork confluence,
4. \*\*Little Mill Creek Campground, ¾ mile downstream of South Fork and North Fork,
5. \*\*Timpanogos Cave National Monument, and
6. \*\*Mouth of American Fork Canyon.

These sample locations may be adjusted to correspond more closely to pre-discharge samples that may be available and will help to identify baseline condition before the discharge.

### Monitoring Plan Schedule

Samples will be collected at each of the six sample locations as described in the tasks identified under each of the Objectives 1–4. Samples will be collected four times per year (i.e., spring, summer, fall, winter) for 5 consecutive years. This proposed monitoring period may be less if it is determined that sediment conditions are no longer harmful to public health, or if irrigation and secondary water use is no longer negatively impacted. More detail on sample collection methods and timing of sampling will be provided in the Comprehensive Monitoring Plan.

## Key Personnel and Estimated Costs

The following identifies key personnel and estimated costs for developing the Comprehensive Monitoring Plan, as requested in the NOV/CO. The Comprehensive Monitoring Plan will address all elements required by the NOV/CO as outlined in the Conceptual Plan above, finalize sampling locations, determine the appropriate schedule and timing of sampling events, and identify laboratory analyses and costs, personnel and scientific collecting permits. SWCA will coordinate with the NUCWCD, UDWQ, UDWR and other stakeholders as necessary to develop the plan. A detailed budget for implementing the monitoring, assimilating and analyzing the data and report preparation will be included. SWCA will submit a draft report by December 12, 2016 to be reviewed by the NUCWCD and the UDWQ. SWCA will address comments and submit the final report by January 6, 2017, assuming comments are received by December 30, 2016.

### Key Personnel

SWCA proposes Dr. Richard Valdez as the Senior Scientist/Principal Investigator. His role will be to coordinate all aspects of the development of the Comprehensive Monitoring Plan. He will be assisted by Mr. David Epstein.

Richard Valdez, Ph.D.

Dr. Valdez has over 40 years of experience in aquatic ecosystems of western North America. He specializes in fisheries and aquatic ecology of streams, rivers, reservoirs, and lakes. He has participated in and coordinated large field studies in the Aleutian Islands, AK; Alcan Pipeline Corridor, AK; Uinta Mountains, UT; Upper Colorado River Basin, CO and UT; Yellowstone National Park, WY; Great Basin, NV; and Grand Canyon, AZ. He has extensive experience with the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Clean Water Act, and Fish and Wildlife Coordination Act. Dr. Valdez has authored and teamed on numerous Environmental Impact Statements, Environmental Analyses, Biological Assessments, Coordination Act Reports, and has been involved in numerous ESA Section 7 consultations as a U.S. Fish and Wildlife Service representative and as a private contractor.

Dr. Valdez serves as a panelist for the Glen Canyon Dam (GCD) Long-Term Experimental Plan, as appointed consultant to the Rio Grande Fishes Recovery Team, and as the New Mexico alternate delegate on the Science Subcommittee of the Rio Grande Endangered Species Act Collaborative Program. He has served as a member of the Colorado River Fishes Recovery Team; GCD Biological Opinion Team; GCD Temperature Control Device Science Panel; Lower Colorado River MSCP Science Review Panel; Flaming Gorge Dam Flow Recommendations Team; as special advisor to the Los Angeles Metropolitan Water District; and as expert witness for the Colorado State Attorney General on the Superfund Program, New Mexico Interstate Stream Commission (NMISC) on the Rio Grande silvery minnow hearings, and Park City Corporation on water litigation for the 2002 Winter Olympics. He also advises the NMISC on endangered fish issues relating to water management in the Rio Grande and Pecos River, and the Arkansas River Shiner Coalition on critical habitat designation on rivers in Oklahoma, Texas, Kansas, and New Mexico. Dr. Valdez is advisor to the Upper Colorado River Endangered Fish Recovery Program, and is principal author of recovery goals for the four Colorado River endangered fishes, published in the Federal Register on September 10, 2001.

David Epstein, M.S.

Mr. Epstein is an aquatic ecologist and water quality specialist in SWCA's Salt Lake City office with over 12 years' experience with aquatic biochemistry, water quality monitoring, nutrient analysis, fisheries ecology, and ecosystem function. He is experienced in water quality monitoring and watershed analyses including nutrient and organic pollutant transport. From 2011 to 2013, he participated (in conjunction with the University of Utah) in a water quality study to assist the state of Utah Division of Water Quality to quantify organic pollutant loads as part of the TMDL process for the Jordan River in Salt Lake County. Mr. Epstein worked with the National Ecological Observatory Network on Red Butte Creek (Salt Lake Co.) to develop sampling and analysis protocols to quantify stream reaeration that have subsequently been implemented on a national scale. Over the past few years he participated as a researcher in the iUTAH research program (joint effort with the University of Utah and BYU) to characterize the influence of urbanization on pollutant transport in rivers draining the Wasatch front.