Quality Assurance Plan
January 20, 2009

NPDES Permit Number IDG130004

Hagerman National Fish Hatchery
3059-D National Fish Hatchery Road
Hagerman, Idaho 83332

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Permittee Signature _____

Name (printed) / Title / Date Bryan Kenworthy / Project Leader / .

EPA Approval Signature _____

Name (printed) / Title / Date _____

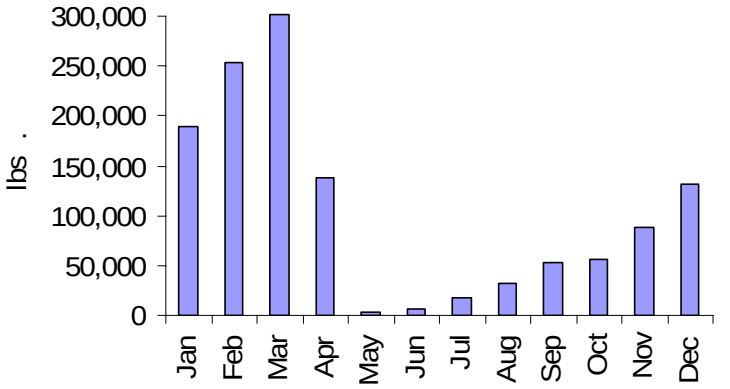
Staff Organization and Responsibilities

Personnel	Position	Responsibilities
Bryan Kenworthy	Project Leader	chief supervisor
Nathan Wiese	Assistant Project Leader	direct supervisor to crew, alternate for water quality sampling and preparation of Discharge Monitoring Reports (DMRs)
Brian Clifford Eric Willet Adam Leija	Motor Vehicle Operators / Fish Culturists	carry out water quantity sampling, implement BMP's on day to day basis, alternates for water quality sampling and preparing DMRs
Jeremy Trimpey	Fish Biologist	has primary responsibility for water quality sampling, prepares monthly DMRs

Sampling Process

The Sampling Process is described in the following pages for each of the required parameters. Please note that we do not hold samples on site. Samples must be delivered to the Rangen Aquaculture Research Center (RARC) at the end of the sampling day. Samples must be kept on ice throughout the sampling day. Sulfuric acid preservative is not used in our sample bottles, so this is noted on the bottle labels (for total phosphorus samples, and for total ammonia, nitrate, nitrite, and total Kjeldahl nitrogen samples) and on the Chain of Custody form. Duplicate, spiked, and/or blank (distilled water) samples will occasionally be delivered to the lab.

Monitoring Description and Schedule



Fish production weight at Hagerman National Fish Hatchery, Jan-Dec, 2008

Flow will be monitored monthly from raceways and the Off Line Settling Basin (OLSB). Total suspended solids and total phosphorous will be monitored quarterly under Permit IDG130004 (Permit), according to the schedule for the monitoring requirements (found on pages 31-33 of the Permit) for facilities producing between 100,000 to 500,000 lbs. Discharge Monitoring Requirement (DMR) Sampling will occur in March (first quarter), April (second quarter), September (third quarter), and December (fourth quarter). These months represent the greatest anticipated fish (steelhead and trout) production during their respective quarters. DMR sampling generally occurs on Thursdays to correlate with the highest expected phosphorus discharge from the facility. Additional monitoring may be conducted on alternate

days depending on variations in the feeding/cleaning schedules.

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Steelhead Production

The Hatchery generally receives steelhead eggs during May and June. The resulting fry are fed daily in the Hatchery Buildings until August. Hatchery tanks are cleaned and mortalities are removed daily. In August, the fingerlings are moved to the Steelhead Raceways. From August until November steelhead are fed by hand daily until they can consume 3.5 mm feed or around 20 fish per pound. Raceway cleaning generally occurs once per week.

In November, the steelhead are generally switched to an intermittent feed schedule using demand feeders. Weekly steelhead rations are calculated using a Hatchery Constant to reach the target release length at the projected release date. One week worth of feed is generally split into a four-day ration and a three-day ration. The four-day ration is administered on Tuesday in demand feeders and is generally consumed during the 24-hour period following feeding. The three-day ration is administered on Saturday and again is generally consumed during the 24-hour period following feeding. Only half of the production raceways are fed the intermittent feed schedule on Tuesday. On Wednesdays, the unfed half is fed on a Wednesday and Sunday intermittent feed schedule. Hence, at any given feeding, only 33 of the 66 Steelhead Raceways at Hagerman NFH are administered feed during the intermittent feeding period from November through March. Steelhead distribution generally starts in the last week of March and finishes the first week of May.

Feeding rates are automatically adjusted weekly for feed conversion and expected temperature-dependent daily length increase using feed spreadsheets. Raceways are sampled inventoried monthly and the Hatchery Constant is adjusted for actual fish growth for a given month.

Raceway cleaning is coordinated with the feeding schedule. The steelhead raceways fed on Tuesday/Saturday are generally cleaned on Thursdays and Mondays. Steelhead raceways fed on Wednesday/Sunday are generally cleaned on Fridays and Tuesdays.

Trout Production

The Hatchery generally receives Rainbow Trout eggs in December and January. Rainbow Trout are kept in the Hatchery tanks until February. Hatchery tanks are cleaned and fed daily. Trout are transferred to the Rainbow Trout raceways in February until May and fed daily until they are large enough to consume 3.5mm feed or around 20 fish per pound (fpp). In May, approximately 90,000 (70%) of the trout are distributed to local rivers and reservoirs at 5" (20 fpp) according to Idaho Fish and Game stocking requests. The remaining 40,000 trout are reared to 9" (2.5 fpp) and released in late September to early October. From May until September, trout are generally fed using demand feeders and an intermittent feeding schedule.

Documentation and Records

Temperature readings, flow measurements, and any other pertinent information from sampling days are recorded in a ARite in the Rain@ notebook which is kept in the EPA file drawer. Lab test results from our water sampling are also kept in the EPA file drawer. All data is entered into a spreadsheet form of the Discharge Monitoring Report (DMR).

Instrument Calibration

Sampling equipment calibration is logged into the "Rite in the Rain@ notebook kept in the EPA file drawer.

Parameter: **flow discharging directly to receiving water**

sample locations Steelhead Raceways

Steelhead Raceway (SST) flow (cfs) is calculated by adding the flows passing through the Main Spring Flume (M) and over the Bickle (B) and Riley (R) broad-crested weirs and subtracting flows passing through the Hatchery 1 flume (H1), gravity fed to the Bickle Ditch (BD), through the Display Pond flume (DP), and diverted from Main Spring to the Rainbow Trout Raceways (MR).

SST Flow = (M + B + R) – (H1 + BD + DP + MR)

Individual site descriptions:

Main Spring (M) - Location No. 3, Site No. 423003

At location No. 3 there is a 4 foot concrete Parshall Flume appromately 25 feet north of the domestic water service building and above the screen chamber. A staff gauge is located in the stilling well beside the Parshall Flume. The rating table for location No. 3 is attached in Appendix A. The rating formula is:

$$Q = 4W(Ha^{(1.522)})(W^{(0.026)})$$

Bickle Lake (B) – Location No. 11, Site No. 423011

At location No. 11 there is a 15 foot Cipoletti weir located at the screen chamber and outlet of Bickle Lake. A staff gauge is located above the weir. The rating table for location No. 11 is attached in Appendix B. The rating formula is:

$$Q = 3.367LH^{(3/2)}$$

Riley Lake (R) – Location No. 8, Site No. 423008

At location No. 8 there is a 7 foot Cipoletti weir located at the screen chamber and outlet of Riley Lake. A staff gauge is located above the weir. The rating table for location No. 8 is attached in Appendix C. The rating formula is:

$$Q = 3.367LH^{(3/2)}$$

Hatchery 1 (H1) – Location No. 6, Site No. 423006

At location No. 6 there is a 9” fiberglass Parshall Flume located in a metering manhole approximately fifty feet from the west corner of the

Hatchery 1 Building. A staff gauge is located on the side of the Parshall Flume. The rating table for location No. 6 is attached in Appendix D. The rating formula is:

$$Q = 3.07H^{(1.53)}$$

Bickle Ditch (BD) – Location No. 12, Site No. 423012

At location No. 12 there is a 15 foot Cipoletti weir on the Bickel Ditch located approximately 370 yards downstream from the Hatchery entrance sign. The ditch is either supplied by gravity feed water from Main Spring or from a pump system on the bottom deck of Steelhead raceways. Location No. 12 is only used for Steelhead raceway flow calculations when it is supplied with gravity feed water from Main Spring. A staff gauge is located above the weir. The rating table for location No. 12 is attached in Appendix B. The rating formula is:

$$Q = 3.367LH^{(3/2)}$$

Display Pond (DP) – Location No. 5, Site No. 423005

At location No. 5 there is a 2 foot concrete Parshall Flume located approximately 50 feet upstream of the Display Pond. Water is maintained to the Display Pond from overflow from the Main Spring diversion. A staff gauge is located on the side of the Parshall Flume and a rating table is provided in Appendix E.

$$Q = 4W(Ha^{(1.522)})(W^{(0.026)})$$

Main Spring to Rainbow Trout Raceways (MR)

Water can be diverted to the Rainbow Trout Raceways via a 20" supply line from the 24" supply line to Bickle Ditch and Hatchery 1 from Main Spring. The amount of water flowing through the 20" supply line is calculated by measuring the staff gauge height at Location No. 5 as water is diverted to the Rainbow Trout Raceways. After the gauge height has stabilized, a difference in water volumes is calculated and this process is repeated until the desired water volume is attained.

sample locations Rainbow Trout Raceways

Flow (cfs) in the Rainbow Trout Raceways is automatically calculated using Spring 17 (S17) measurements and an estimate of water diverted from Main Spring to the Rainbow Trout Raceways (MR).

RBT Flow = S17 + MR

Spring 17 (S17) – Location No. 17, Site No. 423017

At location No. 17 there is an in line ultrasonic meter with permanent ports for wetted transducers located approximately 200 feet from the location No. 17 collection box. Measurements are taken with a Panametrics Transport Model PT868 in-line ultrasonic meter.

Main Spring to Rainbow Trout Raceways (MR)

Water can be diverted to the Rainbow Trout Raceways via a 20" supply line from the 24" supply line to Bickle Ditch and Hatchery 1 from Main Spring. The amount of water flowing through the 20" supply line is calculated by measuring the staff gauge height at Location No. 5 as water is diverted to the Rainbow Trout Raceways. After the gauge height has stabilized, a difference in water volumes is calculated and this process is repeated until the desired water volume is attained.

sample locations Hatchery 1 (H1) – Location No. 6, Site No. 423006

At location No. 6 there is a 9" fiberglass Parshall Flume located in a metering manhole approximately fifty feet from the west corner of the Hatchery 1Building. A staff gauge is located on the side of the Parshall Flume. The rating table for location No. 6 is attached in Appendix D. The rating formula is:

$$Q = 3.07H^{(1.53)}$$

sample locations Display Pond (DP) – Location No. 5, Site No. 423005

At location No. 5 there is a 2 foot concrete Parshall Flume located approximately 50 feet upstream of the Display Pond. A staff gauge is located on the side of the Parshall Flume and a rating table is provided in Appendix E.

$$Q = 4W(Ha^{(1.522)})(W^{(0.026)})$$

sample type Composite
sampling frequency monthly
number of samples One at each measuring site that is used for fish production
sampling process

1. **sampling techniques**: Flow readings are recorded in the blue water readings books and entered into the water spreadsheet. Steelhead (SST), Display Pond (DP), Rainbow Trout (RBT), and Hatchery 1 (H1) flows are entered into the Discharge Monitoring Report spreadsheet. This spreadsheet also calculates the proportion of each sample to mix a 5000 ml aliquot for water quality samples of raceway influent and effluents by the following:

Total Flow (TF) = SST + DP + RBT + H1

SST proportion = (SST/TF)*5000 ml

DP proportion = (DP/TF)*5000 ml

RBT proportion = (RBT/TF)*5000 ml

H1 proportion = (H1/TF)*5000 ml

2. **sample preservation and sample holding time methods**: not applicable

3. **sample Chain-of-Custody procedure**: not applicable

4. **sample shipment procedure**: not applicable

5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, spare parts)**: not applicable

7. **analytical methods (including quality control checks, detection levels)**: not applicable

8. **names, addresses, and telephone numbers for the laboratories used**: not applicable

Parameter: **flow passing through Off-Line Settling Basin (OLSB)**

sample location downstream end of OLSB
sample type meter
sampling frequency monthly
number of samples one sample consisting of two readings (one reading at the beginning and one reading at the end of a 24 hour period)

sampling process

1. **sampling techniques**: (Use the ARite in the Rain@ notebook). This is measured with a Sigma Model 950 Flow meter. Record the flow meter reading (cumulative gallons x 100), and the date and time. Record the cumulative volume again at the end of a 24 hour period in the previously mentioned ARite in the Rain@ notebook. Enter this data into the DMR computer spreadsheet. The spreadsheet determines daily flow (gallons per day) by subtracting the starting volume from the ending volume.

2. **sample preservation and sample holding time methods**: not applicable

3. **sample Chain-of-Custody procedure**: not applicable

4. **sample shipment procedure**: not applicable

5. **instrument calibration procedures**: Calibration procedures are described in the instrument manual and can be completed on site.

6. **preventive maintenance (frequency, standards, and spare parts)**: All maintenance will be carried out by the manufacturer. This is done on an as needed basis.

7. analytical methods (including quality control checks, detection levels): Quality control consists of maintenance performed by the manufacturer.

8. names, addresses, and telephone numbers for the laboratories used (or proposed to be used): Pacific Equipment
301 S. Kings Rd.
Nampa, ID 83651
208-442-6407 (ph)
208-442-6414 (fax)

Parameter: **total suspended solids (TSS) discharging directly to receiving water**

Sample Locations	**Influent**	**Effluent**
Steelhead Raceways	headbox for Raceways 37-58	effluent channel of lowermost bank of steelhead raceways currently in use
Trout Raceways	headbox of Raceways 1-12	effluent channel of Raceways 1-12
Display Pond	just below the upstream rack	at the outfall
Hatchery 1	hose bib	at the outfall

sample type composite
sampling frequency quarterly
number of samples four (for each location) within one workday period
sampling process

1. **sampling techniques**: The following will describe how to collect samples for determination of raceway influent TSS. These procedures will also be followed for collection of samples for determination of raceway effluent TSS, the only difference being the sampling locations which are listed in the above chart. These procedures will assume that all raceways are in use.

First, determine the flow passing through each set of raceways (trout raceways and steelhead raceways) and the display pond. Our in-house computerized DMR form will tell you what proportion of the total flow going directly to the receiving water comes from each of the three locations. This information will be used in flow proportioning your samples.

Next, take four grab samples throughout the day at each location. It is important that the samples are taken at least a half hour apart from each other. To take the samples, use a long handled sampling can and a bucket (there is a separate bucket for each sampling location). First rinse the can thoroughly (3x) with the water to be sampled. Then pour one full can of sample water into the bucket, rinse, and repeat two more times. Then pour one full can of sample water from the rinsed can into the rinsed sample bucket. For additional grab samples, rinse the sample can thoroughly (3x), but not the sample bucket that already contains the previous grab samples. The samples are to be cooled to and maintained at 4 degrees Celsius throughout the day using a cooler with ice surrounding the sample bucket. Throughout the sampling day, samples from the display pond and from Hatchery Building 1 are kept in the maintenance office refrigerator that is maintained at 4 degrees Celsius.

It is important that you segregate all the samples until you are ready to flow proportion your final solution for delivery to the lab.

To flow proportion your composite samples: First determine the percentage of the total flow from each of the locations. Apply each percentage to a volume sufficient to cover all needed samples. For example, 5-liters of composited sample water should be enough to get 1-liter samples for TSS and TP. Say the steelhead raceways have 75% of the total flow passing through them. 75% of 5 liters is 3.75-liters. First, rinse the bucket labled *Raceway Influent Mixing Bucket*, three times with sample water. Then, place 3.75-liters of steelhead raceway influent water in the *Raceway Influent Mixing Bucket*. Determine the correct volumes for each of the other two locations and place representative samples from these locations into this mixing bucket. Swirl the mixing bucket gently, and then rinse a single 1-liter sample bottle with the sample three times. Finally, measure one liter of the sample into the rinsed 1-liter sample bottle.

Do not discard the remaining solution, as it will be used for testing of other water quality parameters.

2. **sample preservation and sample holding time methods**: Samples will be kept in a refrigerated state until delivery to the RARC. Samples will be delivered to the lab at the end of the sampling day.

3. **sample Chain-of-Custody procedure**: One sample chain of custody form is attached to this Quality Assurance Plan. Sample bottles will be clearly labeled with the following information:

Hagerman National Fish Hatchery
Date of sample collection
Location of sample collection (for example, Araceway effluent@)
Analysis to be done (for example, Atotal suspended solids@)

4. **sample shipment procedure**: Samples will be placed in a cooler and hand delivered to the RARC.

5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, spare parts)**: not applicable

7. **analytical methods (including quality control checks, detection levels)**: The RARC uses Methods for Chemical Analysis of Water and Waste, U.S. EPA, 1983, TSS Method 160.2. This has a Method Detection Limit, or MDL, of 1.0 ppm. Blank or spiked samples will be sent to the laboratory at random times.

8. **names, addresses, and telephone numbers for the laboratories used (or proposed to be used)**: Rangen Aquaculture Research Center
2928 South 1175 East
Hagerman, Idaho 83332
contact: Doug Ramsey, Research Scientist
phone: 837-6192
fax: 837-4565

Parameter: **total suspended solids passing through OLSB**

sample locations influent sampling pipe at upper end of OLSB and OLSB effluent channel
sample type composite
sampling frequency quarterly
number of samples four within one workday period
sampling process

1. **sampling techniques**:

***Influent sampling*:** OLSB influent must be sampled with a plastic hand pump, as this water can only be accessed through a pipe of relatively small diameter. This sampling must occur during rearing unit cleaning.

Place the pump intake hose in the access pipe. Rinse pump and sample bucket with sample water. Next, pump twenty-two compressions into a sample bucket.

Maintain the sample water at 4^0 C throughout the day using a cooler with ice surrounding the sample.

After the fourth sample has been added to the container, swirl gently and fill a labeled 1-liter sample bottle. Do not discard remaining solution, as it will be used for testing of other parameters.

***Effluent sampling*:** OLSB effluent is sampled using an ISCO Model 1580 waste water sampling device. Samples are taken every 15 minutes. This device should be on for the duration of other grab samples. Specific operation and maintenance instructions can be found in the factory-supplied instruction manual, on file in the EPA file drawer in the hatchery lab / office.

Place the ISCO near the flowmeter station at the downstream end of the OLSB and rinse sample hose three times.. Allow it to sample throughout the day in the tailrace of the OLSB. At the end of the sampling period, bring the ISCO to the office. Swirl the water in the ISCO carboy and rinse a 1-liter sample bottle three times with the sample water. Then fill the 1-liter sample bottle with 1 liter of the sample. Do not discard remaining solution, as it will be used for testing of other parameters.

2. **sample preservation and sample holding time methods**: Samples will be kept in a refrigerated state until delivery to the RARC. Chilling will be accomplished with the placement of ice around the ISCO carboy at the start of the day. Influent sample water is kept in a water cooler on ice. Samples will be delivered to the RARC at the end of the sampling day.

3. **sample Chain-of-Custody procedure**: One sample chain of custody form is attached to this Quality Assurance Plan. Sample bottles will be clearly labeled with the following information:

Hagerman National Fish Hatchery
Date of sample collection
Location of sample collection (for example, Araceway effluent@)
Analysis to be done (for example, Atotal suspended solids@)

4. **sample shipment procedure**: Bottled samples will be placed in a cooler and hand delivered to the RARC.

5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, spare parts**): Routine maintenance is described in the ISCO instruction manual. The ISCO water sampler will be sent back to the manufacturer for repairs.

7. **analytical methods (including quality control checks, detection levels)**: The RARC uses Methods for Chemical Analysis of Water and Waste, U.S. EPA, 1983, TSS Method 160.2. This has an MDL of 2.0 ppm. Blank or spiked samples will be sent to the laboratory at random times.

8. **names, addresses, and te0lephone numbers for the laboratories used (or proposed to be used)**: Rangen Aquaculture Research Center
2928 South 1175 East
Hagerman, Idaho 83332
contact: Doug Ramsey, Research Scientist
phone: 837-6192
fax: 837-4565

Parameters: **total phosphorus discharging directly to receiving water**

Sample Locations	**Influent**	**Effluent**
Steelhead Raceways	headbox for Raceways 37-58	effluent channel of the lowermost bank of steelhead raceways currently in use
Trout Raceways	headbox of Raceways 1-12	effluent channel of Raceways 1-12
Display Pond	just above the upstream rack	at the outfall
Hatchery 1	hose bib	at the outfall

sample type composite
sampling frequency quarterly
number of samples four (for each location) within one dawn to dusk period
sampling process

1. **sampling techniques**: We will use part of the remaining sample water that was collected for determination of total suspended solids discharging directly to receiving water. See those instructions for direction on sample collection and flow proportioning. A single 1-liter sample will be hand delivered to the RARC for determination of all of the above parameters.

2. **sample preservation and sample holding time methods**: Samples will be kept in a refrigerated state until delivery to the RARC. We do not hold samples on site. Samples must be delivered to the RARC at the end of the sampling day. Samples must be kept on ice throughout the sampling day. Sulfuric acid preservative is not used in our sample bottles, so this must be noted on the bottle labels (for total phosphorus samples, and for total ammonia, nitrate - nitrite, and total Kjeldahl nitrogen samples) and on the Chain of Custody form.

3. **sample Chain-of-Custody procedure**: One sample chain of custody form is attached to this Quality Assurance Plan. Sample bottles will be clearly labeled with the following information:

   Hagerman National Fish Hatchery
   Date of sample collection
   Location of sample collection (for example, Araceway effluent@)
   Analysis to be done (for example, Atotal suspended solids@)

4. **sample shipment procedure**: Samples will be placed in a cooler with ice and hand delivered to the RARC
5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, spare parts)**: not applicable

7. **analytical methods (including quality control checks, detection levels)**: The RARC uses the following methods from Methods for Chemical Analysis of Water and Waste, U.S.

EPA, 1983:

Total Phosphorus Method 365.2. This has a MDL of 0.005 ppm.

Blank or spiked samples will be sent to the laboratory at random times.

8. **names, addresses, and telephone numbers for the laboratories used (or proposed to be used)**: Rangen Aquaculture Research Center
2928 South 1175 East
Hagerman, Idaho 83332
contact: Doug Ramsey, Research Scientist
phone: 837-6192
fax: 837-4565

***Parameters*: total phosphorus passing through OLSB**

sample locations OLSB effluent channel
sample type composite
sampling frequency quarterly
number of samples four within one dawn to dusk period
sampling process

1. **sampling techniques**: We will use part of the remaining sample water that was collected for determination of total suspended solids passing through the OLSB. See those instructions for direction on sample collection.

2. **sample preservation and sample holding time methods**: Samples will be kept in a refrigerated state until delivery to the RARC. We do not hold samples on site. Samples must be delivered to the RARC at the end of the sampling day. Samples must be kept at 4 degrees Celsius throughout the sampling day. Sulfuric acid preservative is not used in our sample bottles, so this must be noted on the bottle labels (for total phosphorus samples, and for total ammonia, nitrate - nitrite, and total Kjeldahl nitrogen samples) and on the Chain of Custody form.

3. **sample Chain-of-Custody procedure**: One sample chain of custody form is attached to this Quality Assurance Plan. Sample bottles will be clearly labeled with the following information:

Hagerman National Fish Hatchery
Date of sample collection
Location of sample collection (for example, Araceway effluent@)
Analysis to be done (for example, Atotal suspended solids@)

4. **sample shipment procedure**: A single 1-liter sample will be hand delivered to the RARC for determination of all of the above parameters.

5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, spare parts)**: not applicable

7. **analytical methods (including quality control checks, detection levels)**: The RARC uses the following methods from Methods for Chemical Analysis of Water and Waste, U.S. EPA, 1983:

Total Phosphorus Method 365.2. This has a MDL of 0.005 ppm.

Blank or spiked samples will be sent to the laboratory at random times.

8. **names, addresses, and telephone numbers for the laboratories used**:

Rangen Aquaculture Research Center
2928 South 1175 East
Hagerman, Idaho 83332
contact: Doug Ramsey, Research Scientist

phone: 837-6192
fax: 837-4565

***Parameters*: total ammonia as N passing through OLSB**

sample locations OLSB effluent channel
sample type composite
sampling frequency quarterly
number of samples four samples taken at one-half hour intervals or greater in a 24-hour period
sampling process

1. **sampling techniques**: Take four grab samples throughout the day in the OLSB effluent channel. It is important that the samples are taken at least a half hour apart from each other. To take the samples, use a long handled sampling can and a bucket (there is a separate bucket for this location). First rinse the can thoroughly (3x) with the water to be sampled. Then pour one full can of sample water into the bucket, rinse, and repeat two more times. Then pour one full can of sample water into the composite bucket. Do not rinse the bucket for subsequent grab samples. The samples are to be cooled to and maintained at 4 degrees Celsius throughout the day using a cooler with ice surrounding the sample bucket.

2. **sample preservation and sample holding time methods**: Samples will be kept in a refrigerated state until delivery to the RARC. We do not hold samples on site. Samples must be delivered to the RARC at the end of the sampling day. Samples must be kept at 4^0 C throughout the sampling day. Sulfuric acid preservative is not used in our sample bottles, so this must be noted on the bottle labels (for total phosphorus samples, and for total ammonia, nitrate - nitrite, and total Kjeldahl nitrogen samples) and on the Chain of Custody form.

3. **sample Chain-of-Custody procedure**: One sample chain of custody form is attached to this Quality Assurance Plan. Sample bottles will be clearly labeled with the following information:

Hagerman National Fish Hatchery
Date of sample collection
Location of sample collection (for example, Araceway effluent@)
Analysis to be done (for example, Atotal suspended solids@)

4. **sample shipment procedure**: A single 1-liter sample will be hand delivered to the RARC for determination of all of the above parameters.

5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, spare parts)**: not applicable

7. **analytical methods (including quality control checks, detection levels)**: The RARC uses the following methods from Methods for Chemical Analysis of Water and Waste, U.S. EPA, 1983:

Total Ammonia Method 350.3. This has a MDL of 0.01 ppm.

Blank or spiked samples will be sent to the laboratory at random times.

8. **names, addresses, and telephone numbers for the laboratories used**:

Rangen Aquaculture Research Center
2928 South 1175 East
Hagerman, Idaho 83332
contact: Doug Ramsey, Research Scientist
phone: 837-6192
fax: 837-4565

Parameter: **temperature and pH passing through OLSB**

sample location OLSB effluent channel
sample type meter
sampling frequency quarterly
number of samples four samples taken at one-half hour intervals or greater in a 24-hour period in conjunction with the grab samples taken for the composite ammonia samples
sampling process

1. **sampling techniques**: This will be a grab sample using the Hanna Instruments Model 98127 handheld pH and temperature meter. The sample will be taken in conjunction with the total ammonia as N passing through OLSB sample before the sample is added to the composite bucket.

2. **sample preservation and sample holding time methods:** not applicable

3. **sample Chain-of-Custody procedure**: not applicable

4. **sample shipment procedure**: not applicable

5. **instrument calibration procedures**: Specific calibration procedures for the pH and temperature meter can be found with the meter.

6. **preventive maintenance (frequency, standards, and spare parts)**: Storage and cleaning solution will be kept with the meter. If the electrode is changed it will be recorded by date and logged which is kept with the meter.

7. **analytical methods (including quality control checks, detection levels)**: The operations manual for the Hanna Instruments Model 98127 handheld pH and temperature meter reports that this meter should be accurate to within +/- 0.5°C and +/- 0.1pH.

8. **names, addresses, and telephone numbers for the laboratories used (or proposed to be used)**: not applicable

Parameter: **total ammonia as N from receiving water upstream from the outfall**

sample location Electric Weir Site
The Electric Weir Site was chosen to sample total ammonia as N from receiving water upstream from the outfall of the OLSB to represent the ambient stream conditions of Riley Creek. Since the Steelhead Raceway outfall can be considered the headwaters of the creek, it is appropriate to sample below the raceway outfalls, but above the OLSB outfall. The Electric Weir Site (not in use) was also chosen to provide a relatively unobstructed and safe access to Riley Creek for sample collection.

sample type grab
sampling frequency quarterly
number of samples one during the same time that effluent composite samples are being taken
sampling process

1. **sampling techniques**: A sample will be collected with 1-liter sampling bottle

2. **sample preservation and sample holding time methods**: Samples will be kept in a refrigerated state until delivery to the RARC. We do not hold samples on site. Samples must be delivered to the RARC at the end of the sampling day. Samples must be kept at 4 degrees Celsius throughout the sampling day. Sulfuric acid preservative is not used in our sample bottles, so this must be noted on the bottle labels and on the Chain of Custody form.

3. **sample Chain-of-Custody procedure**: One sample chain of custody form is attached to this Quality Assurance Plan. Sample bottles will be clearly labeled with the following information:
   Hagerman National Fish Hatchery
   Date of sample collection
   Location of sample collection (for example, Araceway effluent@)
   Analysis to be done (for example, Atotal suspended solids@)

4. **sample shipment procedure**: A single 1-liter sample will be hand delivered to the RARC for determination of all of the above parameters.

5. **instrument calibration procedures**: not applicable

6. **preventive maintenance (frequency, standards, and spare parts)**: not applicable

7. **analytical methods (including quality control checks, detection levels)**: The RARC uses the following methods from Methods for Chemical Analysis of Water and Waste, U.S. EPA, 1983:

   Total Ammonia Method 350.3. This has a MDL of 0.01 ppm.

8. **names, addresses, and telephone numbers for the laboratories used (or proposed to be used):**
   Rangen Aquaculture Research Center
   2928 South 1175 East
   Hagerman, Idaho 83332, 208-837-6192 (ph)

Parameter: **temperature and pH from receiving water upstream from the outfall**

sample location Electric Weir Site
sample type meter
sampling frequency quarterly
number of samples one reading in conjunction with ammonia as N from receiving water upstream from the outfall
sampling process

1. **sampling techniques**: This will be a simple measurement using the Hanna Instruments Model 98127 handheld pH and temperature meter.

2. **sample preservation and sample holding time methods:** not applicable

3. **sample Chain-of-Custody procedure**: not applicable

4. **sample shipment procedure**: not applicable

5. **instrument calibration procedures**: Specific calibration procedures for the pH and temperature meter can be found with the meter.

6. **preventive maintenance (frequency, standards, and spare parts)**: We have a number of non-mercury thermometers on hand. Storage and cleaning solution will be kept with the meter. If the electrode is changed it will be recorded by date and logged which is kept with the meter.

7. **analytical methods (including quality control checks, detection levels)**: The operations manual for the Hanna Instruments Model 98127 handheld pH and temperature meter reports that this meter should be accurate to within +/- 0.5°C and +/- 0.1pH.

8. **names, addresses, and telephone numbers for the laboratories used (or proposed to be used)**: not applicable

Sample and Analytical Requirements					
Parameter	Method	Method Detection Limit	Preservation	Volume and Container	Holding Time
Total Phosphorous	EPA 365.4 or 365.2	0.005 mg/L	Cool 4˚ C H2SO4 to pH<2	250 ml HDPE	28 days
Residue, Non-Filterable (TSS) Settleable solids	EPA 160.2 EPA 160.5	2.0 mg/L n/a	Cool 4˚ C	250 ml HDPE 1L HDPE	7 days 48 hours
Nitrate	EPA 353.3	0.1mg/L	Cool 4˚ C	250 ml HDPE	28 days
Nitrite	EPA 353.3	0.01mg/L	Cool 4˚ C	250 ml HDPE	28 days
Ammonia	EPA 350.2	0.01mg/L	Cool 4˚ C H2SO4 to pH<2	1L HDPE	28 days
Total Kjeldahl Nitrogen (TKN)	EPA 351.3	0.03mg/L	Cool 4˚ C H2SO4 to pH<2	1L HDPE	28 days
Temperature	EPA 170.1	0.1˚ C	none required	n/a	analyze immediately
Dissolved Oxygen (DO)	EPA 360.1 or 360.2	0.05mg/L	none required	300 ml BOD bottle	analyze immediately
pH	EPA 150.1	0.1 S.U.	none required	n/a	analyze immediately
BOD5	EPA 405.1	15mg/L	Cool 4˚ C	250-300 ml HDPE	48 hours
Total Residual Chlorine	EPA 330.1 or 330.5	0.01mg/L	none required	10 ml HDPE	analyze immediately
Oil and grease	EPA 1664 Revision A	5 mg/L	Cool 4˚ C H2SO4 to pH<2	glass	28 days

Sample measurements which require acid preservation (see above table) will be preserved using the following procedure:

1. Nutrient samples which require acid preservation will be collected without the addition of acid in the field and shipped to the lab at 4 degrees Celsius within 24 hours of sample collection (at the end of the sampling day).
2. The sample collector will state on the labels that acid has not been added in the field to the sample bottles.
3. The sample collector will state on the chain of custody form that the laboratory must add sulfuric acid to lower the pH of the sample to less than 2 immediately upon arrival at the laboratory.
4. Finally, the Sample Custodian at the laboratory will state on the chain of custody form that Total Phosphorous, Nitrate-Nitrite, Ammonia, Total Kjeldahl Nitrogen, and Oil and Grease samples were preserved with sulfuric acid immediately upon arrival at the laboratory.

Duplicate samples will be collected and submitted to the laboratory for analysis. The results for the measurement of these duplicate samples will be used to measure precision of Facility samples by calculating the percent difference of duplicate samples. The normal frequency for the collection of duplicate samples is one duplicate sample per ten field samples collected.

The Quality Assurance Plan describes the methods and procedures used for monitoring of Hatchery influent and effluent water. Samples and measurements are representative of the volume and nature of the monitored influents and effluents.

Total Suspended Solids

Reference: USEPA 160.2 performed by the Rangen Research Laboratory.

Phosphorus

Reference: USEPA 365.2 performed at the Rangen Research Laboratory.

Ammonia

Reference: USEPA 350.2/350.3 performed at the Rangen Research Laboratory.

Other Sampling Guidelines

Sampling will occur during tank or raceway cleaning. For composite sampling, sample times will be noted in Discharge Monitoring Report Worksheet.

Blank or spiked samples will be sent to the laboratory at random times.

Discharge Monitoring Report (DMR)

Project Leader will review and sign DMR. It is then sent to the EPA and DEQ (Twin Falls) by the 20th of each month.

Reporting of Exceedance

Any exceedance of any effluent limitation shall be reported by phone to EPA and the responsible IDHW-DEQ office within *24* hours of receiving the data from the laboratory. A written submission of the data will be sent to both agencies within *5* days of receiving the data from the laboratory.

EPA Contact
Region 10
Environmental Protection Agency
1200 Sixth Ave. OCE-130
Seattle, WA 98101
Phone: 206-553-1846

IDHW-DEQ Contact
Idaho DEQ Regional Manager
1363 Filmore St.
Twin Falls, ID 83301-3035
Phone: 208-736-2190
Fax: 208-736-2194

General Procedures for Composite Sampling

Materials needed

1. 10 square buckets that are marked for sampling:
   a. Steelhead Raceways Influent
   b. Steelhead Raceways Effluent
   c. Trout Raceways Influent
   d. Trout Raceways Effluent
   e. OLSB Influent
   f. OLSB Effluent
   g. Display Pond Influent
   h. Display Pond Effluent
   i. Hatchery 1 Influent
   j. Hatchery 1 Effluent
2. The ISCO water sampler
3. Hanna pH and temperature meter
4. ACoffee can on a stick@ grab samplers
5. Display pond and Hatchery 1 grab sampler
6. The plastic hand pump for sampling sed pond influent
7. The yellow ARite in the Rain@ notepad
8. Properly labeled sample bottles (obtain bottles from RARC, but make the labels yourself)
9. 5 coolers
10. Ice for coolers and ISCO
11. 1,000 ml graduated cylinder

1. Put the above square buckets, the round Ased pond influent@ bucket, the coolers (with ice packs), the ISCO (with ice), the grab sampler, the plastic hand pump, the Hanna pH and temperature meter, and the yellow ARite in the Rain@ notepad in the flatbed pickup.

2. Additional Hatchery personnel will need to perform water readings (water quantity) and clean raceways while the water quality samples are being collected.

3. Take four grab samples at each of the above locations throughout the day. It is important that consecutive grab samples at any given location be separated by intervals of more than 30 minutes. Record the timing of sampling events in the yellow notepad. Set the ISCO to automatically sample the sed pond effluent channel during the day.

4. Start at the headbox of the steelhead raceways. Thoroughly rinse the grab sampler a minimum of three times with water from the headbox above R43. Then put one full can of water in the ASteelhead Raceways Influent@ bucket. Swirl the bucket and dump out

the water. Repeat two more times. Place one more full can of water in the bucket, cover, and place in a cooler with ice on the grip strut.

5. Repeat this procedure for the following locations:

1.	Steelhead Raceways Effluent	Effluent Channel below R81
2.	Trout Raceways Effluent	Effluent Channel below R1
3.	Trout Raceways Influent	Headbox above R6
4.	Display Pond Influent	Just below upstream rack
5.	Display Pond Effluent	Outfall over tailboards
6.	Hatchery 1 Influent	Hose bib
7.	Hatchery 1 Effluent	Outfall at Riley Creek

6. Next activate the sed pond effluent flow meter and initiate sampling in the sed pond effluent channel with the ISCO.

   Go to the flow meter station at the downstream end of the sed ponds. Open the flow meter readout station to the right of the breaker box. Check to make sure that the heater fan is working. Record in the yellow notebook the date and time and the accumulated flow volume. This is the cumulative volume (gallons x 1000) which has passed through the flow meter.

   Place ice around the carboy inside the ISCO and place the ISCO in the wooden holding structure on the cement wall. Plug the ISCO into the outlet to the left of the breaker box. Place the intake hose in the sed pond effluent channel (don=t let it rest on the bottom). Pump some water up through the hose (turn the switch to Aforward@) and then pump it back into the effluent channel to rinse the hose (turn the switch to Areverse@). Repeat two more times. Turn the switch to Aautomatic@ to set the ISCO to sample throughout the day. You shouldn=t have to adjust the time, volume, etc. as those parameters have already been set. If you ever have to, you should refer to the ISCO instruction manual located in the EPA file drawer.

7. Now sample the OLSB influent. This water is sampled with the plastic hand pump through the approximately 4" diameter steel access pipe sticking up from the ground at the head end of the sed ponds (the pond on the right side as you=re looking downstream). Before you sample here, be sure to coordinate with your coworkers who are cleaning raceways. You want to collect the sample when the dirtiest water is passing through the pipe, so make sure somebody will be diverting fish waste to the OLSB during each of your sampling events.

   Remove the threaded cap from the access pipe and place the intake hose of the plastic hand pump down into the pipe. Pump 10 to 20 compressions into each bucket to rinse the pump and the buckets. Swirl the water in the buckets and dump it out. When the

water entering the OLSB appears to be cloudy, pump 22 compressions into one of the buckets. Check the water entering the sed pond again. If it begins to look dirtier, pump 22 compressions into the other bucket. Keep going back and forth like this until you think that you=ve collected the dirtiest sample possible. Place this water in the square bucket, cover, and place the bucket inside the cooler with ice packs. When you=re sampling here later, pump into the round bucket, then check to see if the incoming water looks dirtier. If it does, dump out the water you just collected in the round bucket, and replace it with a new sample. Again, keep going back and forth like this until you think that you=ve collected the dirtiest sample possible. Then transfer this water to the square bucket in the cooler. Do not dump out the water in the square bucket which you sampled earlier.

8. Next collect the ammonia, pH, and temperature sample from the OLSB effluent.

   Use the long handled sample can near the flow meter station. Rinse the sample can and pH meter three times and then rinse the sample bucket three times as well. Get one full can of water and read the pH and temperature before dumping it into the composite bucket. Record the pH and temperature to the nearest tenth place (0.1) in the yellow sample book.

9. Now collect the ammonia, pH, and temperature grab sample from the Old Electric Weir Site.

   The pH and temperature can be collected directly from Riley Creek and recorded in the yellow book. Fill a 1-liter sample bottle with water and rinse three times with sample water. Then collect 1 liter of water in the 1-liter sample bottle. Label and store this bottle in the Maintenance Office refrigerator at 4^0 C. This site only needs to be sampled once during the sampling day and not repeated for a composite sample.

10. Follow these instructions to sample again at these locations three additional times during the day at half hour intervals or greater. Be sure to allow enough time after collection of the final samples to do the flow proportioning and to deliver the samples to the Rangen Aquaculture Research Center before the day is over.

Bottling EPA Samples

1. Do whatever flow proportioning calculations you need to do.

2. Label the sample bottles.

3. Arrange your sample collection buckets in order of dirtiness. Start working from the cleanest water first, finish with the dirtiest water. This will reduce the chances of transferring nutrients or TSS to the cleaner water. Take all the samples you will need from a particular bucket before moving on to another bucket. All sample buckets, graduated cylinders, and 1-liter sample bottles should be rinsed three times with sample water before collecting samples.

4. Use the set of round plastic buckets for mixing sample water. Pouring the water from the square buckets to the round buckets and back into the square buckets will ensure that all materials are evenly dispersed throughout the solution. Do this each time before you fill the 1000 ml graduated cylinder to prevent settling.

5. First aliquot - TSS sample Raceway influent - Rinse the bottle with some sample water before filling and repeat two more times. Pour 1000 ml into the 1-L sample bottle and put sample bottle on ice.

6. Second aliquot - Aall nutrients@ or total phosphorus sample - Rinse the bottle with some sample water before filling and repeat two more times. Do this one last because the 1000 ml graduated cylinder should, by now, be thoroughly rinsed of any residual nutrient contamination from previous samples that would bias the test results.

7. Repeat these procedures for the Raceway effluent sample. Then do the OLSB effluent sample, OLSB effluent ammonia sample, and lastly the OLSB influent sample.

8. Prevent contact between your hands and the sample water. This is especially important for collecting samples for phosphorus determination.

Sample Handling and Chain of Custody Procedures

(General Procedure for Transferring 8-hour Composite Samples from Buckets to Bottles)

Samples will be kept refrigerated until delivery to the Rangen Aquaculture Research Center (RARC). All samples will be delivered at the end of the sample collection day. One sample chain of custody form is attached to this Quality Assurance Plan. Complete the upper part of the form, listing all bottles delivered. The sample collector will state on the chain of custody form that the laboratory must add sulfuric acid to lower the pH of the sample to less than 2 immediately upon arrival at the laboratory. The RARC employee accepting the sample bottles should complete the ATransferred To@ section. They should also state on the chain of custody form that Total Phosphorous, Nitrate-Nitrite, Ammonia and Total Kjeldahl Nitrogen samples were preserved with sulfuric acid immediately upon arrival at the laboratory. Keep the Chain of Custody form on file in our EPA file drawer.

Sample bottles will be clearly labeled with the following information:

Hagerman National Fish Hatchery
Date of sample collection
Location of sample collection (for example, Araceway effluent@)
Analysis to be done (for example, Atotal suspended solids@)
No acid preservative added (if on a bottle for determination of total phosphorus)

Mix the sample water according to the instructions within this QA Plan. Prevent contact between your hands and the sample water. This is especially important for collecting samples for nutrient determination.

Data Management

Flow measurements for the OLSB will be kept in yellow sample notebook. This book will be kept in the EPA file drawer. Enter the data into the current month=s Excel DMR spreadsheet. Also include the current production data on the DMR.

Certification of Completion and Implementation
of the Quality Assurance Plan

Hagerman National Fish Hatchery
NPDES Permit Number ID-G-13-0004

I have read and been trained in the proper execution of this Quality Assurance Plan.

_____

Nathan Wiese Date
Assistant Project Leader

_____

Jeremy Trimpey Date
Fish Biologist

_____

Brian Clifford Date
Motor Vehicle Operator

_____

Eric Willet Date
Motor Vehicle Operator

_____

Adam Leija Date
Animal Caretaker

List of Attachments:

1) Chain of Custody Form
2) Site Plan Map
3) Appendix A – Rating table for 4 ft Parshall flume at Main Spring
4) Appendix B – Rating table for 15 ft Cipoletti Weir at Bickle Lake and State Wildlife Management Area (Bickle Ditch)
5) Appendix C – Rating table for 7 ft Cipoletti Weir at Riley Lake
6) Appendix D – Rating table for 9” Parshall flume at Hatchery 1
7) Appendix E – Rating table for 2 ft Parshall flume at Display Pond
8) Rangen Research Method Detection Limits and Quality Assurance Plan
9) Training Certificates and Additional Attachments