

SEAN environmental contaminants SOP 3: field and laboratory guidelines for total mercury analysis of Dolly Varden

Version 1.0

Revision history log:

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-	8/1/2018	C. Sergeant, A. Cyr	Initial version	1.0

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1 Introduction

This standard operating procedure (SOP) covers all the information necessary for SEAN staff and partners to plan and execute the field work necessary to collect, preserve, and ship Dolly Varden (*Salvelinus malma*) to a qualified laboratory for total mercury analysis. Tasks include obtaining the permits required to perform the field sampling, gathering required supplies, observing field siting and trapping requirements, and meticulously handling and preserving samples for shipping and subsequent analysis. It is important that all points of this SOP are read, clearly understood, and implemented as necessary six to nine months before field collection activities are planned. The project leader (currently, the SEAN ecologist) is responsible for ensuring this SOP is followed safely and accurately. Please refer to SOP 1 for operational safety considerations. It is important to note that this SOP is written very specifically for collecting Dolly Varden for total mercury analysis. If future monitoring includes additional species, sites, or analytes (such as organic compounds), more preparation and adjustments to the SOP will be necessary. More background on the pilot work developing this work can be found in:

Cyr, A., C. J. Sergeant, J. A. Lopez, and T. M. O'Hara. 2014. Developing a freshwater contaminants monitoring protocol for the Southeast Alaska Network: Summary of 2013 fish and habitat sampling in Klondike Gold Rush and Sitka National Historical Parks. Natural Resource Data Series NPS/SEAN/NRDS—2014/679. National Park Service, Fort Collins, Colorado.

Cyr, A., C. J. Sergeant, J. A. Lopez, and T. M. O'Hara. 2017. Assessing the influence of migration barriers and feeding ecology on total mercury concentrations in Dolly Varden (*Salvelinus malma*) from a glaciated and non-glaciated stream. *Science of the Total Environment* 580: 710-718.

Nagorski, S., D. Engstrom, J. Hudson, D. Krabbenhoft, J. DeWild, E. Hood, and G. Aiken. Scale and distribution of global pollutants in Southeast Alaska Network park watersheds. Natural Resource Technical Report NPS/SEAN/NRTW-2001/496. National Park Service, Fort Collins, Colorado.

Nagorski, Sonia A., Daniel R. Engstrom, John P. Hudson, David P. Krabbenhoft, Eran Hood, John F. DeWild, and George R. Aiken. 2014. Scale and distribution of mercury in southeastern Alaskan streams influences by glaciers, wetlands, and salmon. *Environmental Pollution*. 184: 62-72.

2 Field procedures

1 Permitting

Based on pilot results described in the protocol narrative, Dolly Varden are the target biota for long-term monitoring of freshwater contaminants. Since these fish must first be euthanized to conduct the necessary chemical analyses, there are up to three permits that may need to be obtained prior to field efforts taking place. Additionally, for the two Indian River sites, the Project Leader should check with appropriate staff with the Tongass National Forest to determine if a Forest Service permit is required for fish collection in addition to the Alaska Department of Fish and Game (ADF&G) permit. A minimum of three months should be budgeted for procuring each permit.

1. Institutional Animal Care and Use Committee (IACUC): This permit covers the research collection of any vertebrate animals. Applicants must obtain approval for the chosen research species, fish handling procedures, and euthanasia and preservation methods. Since this protocol involves toxicological analyses, a chemical for euthanasia (such as MS 222) is not recommended. Instead, blunt force trauma to the back of the head is recommended. This method is approved by the Panel on Euthanasia of the American Veterinary Medical Association (S6.2.2, AVMA 2013), and the Canadian Council on Animal Care Guidelines on the Care and Use of Fishes in Research, Teaching, and Testing (Guidelines 112 and 113, CCAC 2005). Blunt force trauma does not introduce new chemicals into the body tissues of the fish. Upon completion of collection activities, the SEAN ecologist will submit a report summarizing the number of specimens collected and any problems or unintentional deaths with sampled individuals. See this website for more information: <http://nature.nps.gov/biology/iacuc/>
2. Alaska Department of Fish and Game: ADF&G requires a permit for fish collection in State of Alaska waters. Within park boundaries, this permit may not always be necessary. Before applying, check with each park's Chief of Resources for current policy. Applicants must write a narrative justifying their research plan, sampling design, collection methods, collection locations, euthanasia methods, number of fish euthanized, and personnel involved. A summary report is required following the completion of all field collection activities. ADF&G will provide details on the format of this report upon assignment of the permit. See this website for more information: http://www.adfg.alaska.gov/index.cfm?adfg=otherlicense.aquatic_resource
3. NPS individual park unit (GLBA, KLGO, SITK): Each SEAN park unit may require a permit for specimen collection activities. Contact the research permit coordinator for each park for current policy and application procedures. It is possible to obtain one permit that covers collection activities in all park units involved, but researchers should consult with permit coordinators for the preferred approach. Each year an Annual Investigator's Report is required. This report updates the details of the original study plan (if necessary), summarizes the study activities over the preceding year, and estimates funding expenditures. See these websites for more information on NPS Research Permit and Reporting System (RPRS) and GLBA-specific information on research in wilderness lands:
 - <https://irma.nps.gov/rprs/Home>
 - <http://www.nps.gov/glba/naturescience/research-permit-application-process.htm>

2 Equipment and Supplies

Six to nine months before sampling is planned, the Project Leader should ensure that the field supplies required for collecting Dolly Varden in a clean manner are organized and in working order (Table SOP-3.1).

Table SOP-3.1. Field supplies for collecting Dolly Varden for total mercury analysis at a single site. These items can fit in two large backpacks (65-80 liters) for transport to access sample sites, but a crew of three lightens the load considerably. Sections below this table have more details regarding individual items such as salmon egg bait and trap labels.

Item	Quantity
Minnow traps	10
Bait bags	10
Betadine solution	16 oz. bottle
Sterilized salmon eggs (see Section 2.4)	5 lb
Nylon cord, 3-4 mm	300 ft (30 ft per trap)
Trap labels on Rite-in-the-Rain paper	10 (1 per trap)
Data sheets on Rite-in-the-Rain paper	5
Nitrile gloves	10 pairs
Certified clean aluminum foil (e.g., Ultra-Clean Supremum Aluminum Foil)	20 yards
Ziplock bags (gallon size)	30-40
Waterproof data sheets	5
Pencils/extra lead	3
Permanent markers (e.g., fine tip Sharpie)	3
Camera w/ 8GB or more SD card	
Portable scale (accuracy to 1/10 g)	
Measuring board (1 mm increment, <400 mm)	
GPS	
Sample cooler with ice	
Small aquarium net	
1-2 gallon bucket	
Waterproof notebook	
Spare GPS and camera batteries	
Large forceps	
Small scissors	
Large umbrella	
Field identification of coastal juvenile salmonids (Pollard et al. 1997)	
Duct tape	
Clipboard	
Pocket knife with serrated blade	

Each trap set should be accompanied with an appropriate label printed on waterproof paper and laminated (Figure SOP-3.1).

U.S. National Park Service
 Freshwater contaminants monitoring
 Please do not disturb

Trap #1

NPS permit # **SITK-2015-SCI-001**
 IACUC permit # **123456-1**
 ADF&G permit # **SF2015-123**

Contact person:
 Johnny Sampler
 National Park Service
 Ecologist
 (907) 123-4567

Figure SOP-3.1. Example label for individual minnow trap.

3 Sample Site Locations

Six sites have been chosen for long-term freshwater contaminants monitoring in SEAN parks: 3 in GLBA, 1 in KLGO, and 2 in SITK. Not including travel, trapping fish and preserving Dolly Varden samples takes two people approximately 3-4 days for GLBA and 1-2 days each for KLGO and SITK. To remain consistent with previous efforts, sampling should occur from late July to early August. Researchers access sampling sites using the GPS coordinates and site descriptions in Figure SOP-3.1.

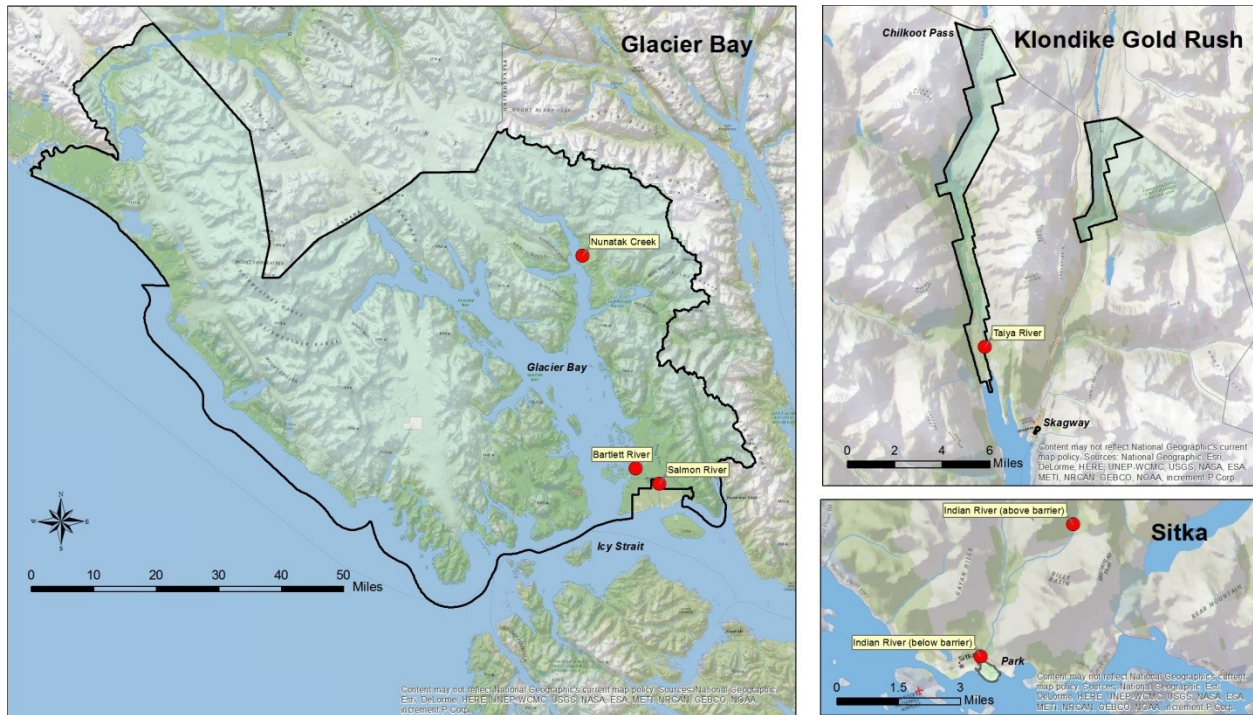


Figure SOP-3.1. Map of SEAN permanent freshwater contaminants monitoring stations in GLBA, KLGO, and SITK. Red dots represent Dolly Varden tissue analysis collection sites.

1. Glacier Bay National Park and Preserve (GLBA)

Three streams are sampled for Dolly Varden in GLBA, two accessed by foot off the Gustavus road system (Bartlett and Salmon Rivers), and one accessed by boat in upper Glacier Bay (Nunatak Creek). All sites are accessible to anadromous salmon populations (Table SOP 3-2). While the Bartlett River is not co-located with any other existing SEAN long-term monitoring programs, it received the most fishing pressure of freshwater systems accessible from the GLBA frontcountry and has existing data on salmon abundance and fishing effort (C. Soiseth, personal communication). Nunatak Creek is co-located with two SEAN climate stations and has previous data on mercury in water, bed sediments, invertebrates, and juvenile coho salmon *Oncorhynchus kisutch* (Nagorski et al. 2011). The Salmon River is co-located with water quality and streamflow monitoring programs.

Table SOP-3.2. Glacier Bay sample sites.

Site	Site code	Latitude	Longitude
Bartlett River	GLBA_BA	58.486605°	-135.845036°
Nunatak Creek	GLBA_NU	58.976211°	-136.095414°
Salmon River	GLBA_SA	58.452350°	-135.740900°

2. Klondike Gold Rush National Historical Park (KLGO)

The Taiya River is sampled for Dolly Varden in KLGO. The site at the Taiya River bridge is co-located with a SEAN climate station, water quality monitoring sonde, and streamflow

gage (Table SOP-3.3). During late July of 2013 at this site, Dolly Varden were numerous in minnow traps set near the banks on both sides of the river (Cyr et al. 2014).

Table SOP-3.3. Klondike Gold Rush sample site.

Site	Site code	Latitude	Longitude
Taiya River	KLGO_TA	59.512139°	-135.347083°

3. Sitka National Historical Park (SITK)

The Indian River is the only river flowing through SITK, and therefore is the only option for sampling Dolly Varden. The Indian River Trail parallels much of the river, making access efficient. Because previous sampling of Dolly Varden revealed divergent mercury concentrations in Dolly Varden collected above and below anadromous barriers (Cyr et al. 2017), one site above barrier (upstream of SITK boundaries) and one site below barrier (approximately 50 m upstream of SITK boundaries) are sampled (Table SOP-3.4). The SEAN water quality and streamflow monitoring programs are co-located with the below anadromous barrier site (Figure SOP-3.1).

Table SOP-3.4. Sitka sample sites.

Site	Site code	Latitude	Longitude
Indian River (above barrier)	SITK_IN_A	57.088083°	-135.236889°
Indian River (below barrier)	SITK_IN_B	57.052777°	-135.317500°

4 Minnow trap preparation and deployment

Previous minnow trapping conducted in late July through mid-August was successful at capturing Dolly Varden using a Gees G-40 Minnow Trap (23 cm x 44.5 cm, 2.5 cm opening). Ensure all minnow traps are in working order, with no holes, sharp edges, missing clips, or broken cord. Traps are baited with sterilized commercial salmon eggs or fresh salmon eggs and bait bags that have been disinfected by soaking for 10 minutes in a 1:100 betadine solution (or some other type of iodophor disinfectant). Eggs must remain frozen or refrigerated until the day of trapping. If eggs must be stored longer than a few days, freezing is the best option.

At each site, place bait into mesh bait bags while wearing nitrile gloves. Mesh bait bags should allow egg scent and fluids to seep through the water column, but should not allow eggs to be eaten by trapped fish. Prepare bait bags on top of certified clean foil (e.g. Ultra-Clean Supremium Aluminum Foil). Do not allow bait to touch bare hands, or any surfaces other than the foil. Securely tie bait bags inside of a complete, assembled minnow trap with an appropriate length of line for securing to shoreline objects (approximately 10 m) and trap label (Figure SOP-3.1).

Select a suitable habitat location to deploy traps. To improve chances for a high catch rate, ensure that a variety of habitat types are sampled (Figure SOP-3.2) with depths ranging from 30 cm to 2 m. Do not place minnow traps in mid-channel, fast water areas as they are not likely to stay in place. After choosing a location, tie the end of the trap line to a secure location on shore such as stiff tree trunk or large angular rock. Ensure the trap label is easily visible to anyone passing by the site. Unless time is very constrained, soak traps at least two hours. Eight hours to overnight is best, if possible.



Figure SOP-3.2. Examples of productive habitat types for sampling Dolly Varden: gently sloping gravel bars and small pools formed in association with large and small woody debris.

5 Recording field data

There are several pieces of information to record on the field data sheet (Figure SOP-3.3) at each sample site when traps are deployed. Field personnel should validate they are sampling in the vicinity of the GPS coordinates listed for each site in this SOP before beginning trap deployment at the site. Individual trap GPS locations are not required. Important field information includes:

1. Site name
2. Trap numbers (Site name 1, site name 2, and so on)
3. Personnel present
4. Date and time traps set
5. Date and time traps retrieved
6. Approximate water depth for each trap
7. Trap condition at retrieval (note if trap was tampered with, water level dropped, etc.)

8. Catch information: number caught by species, number Dolly Varden kept for analysis, individual fork length, mass
9. Fish identification serial number

After field collections are completed, these data field sheets are scanned and saved to create deliverable EC_C.

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Figure SOP-3.3. Front and back page of the SEAN freshwater contaminants field data sheet. Printable versions of this sheet can be found on the SEAN Environmental Contaminants webpage toolbox.

6 Trap Retrieval and Field Sample Preparation

Upon returning to the sample site, all the traps are collected and brought to a central processing area near the water. Trapped fish must remain in the water until processing. Traps should be processed one at a time. After deciding the number of fish in a given trap that will be euthanized, transfer trapped fish into a bucket filled with river water from the site.

To be comparable to previous sampling events, individual Dolly Varden fork length should range from approximately 80-150 mm. Fish in this size range are probably 1-4 years old and unlikely to have migrated to saltwater during the spring (Cyr et al. 2017). The mass of 80 mm individuals are also likely to provide the minimum of 3-4 g wet mass necessary for total mercury analysis. To increase our ability to detect site-specific differences in Dolly Varden mercury concentrations, at least 15 fish (if permitted) should be retained for analysis from each site. It may be prudent to retain up to 25 for shipping in case extra funds are available for analysis and to ensure that at least 15 individuals arrive at the laboratory in good shape. Under no circumstance should field personnel euthanize and retain more fish than the number permitted for collection.

Using an aquarium net and wearing clean nitrile gloves, remove fish one at a time, recording species and fork length and mass of each fish. After measuring, and while still wearing a pair of nitrile gloves, euthanize fish following the permitted IACUC method, which at the time this SOP was written was blunt force trauma to the head (i.e., a swift finger flick). Only process one fish at a time so euthanized fish do not mix in the bucket. For each fish that is euthanized, place it on the shiny side of a sheet of certified clean aluminum foil. Do not allow fish to touch the ground or clothing. If it is raining, hold an umbrella over the field personnel processing fish to minimize rainfall contamination in the foil. Fish must be securely wrapped three times to ensure minimizing any outside or cross-contamination. Place the foil-wrapped fish in a labeled, sealable plastic bag. Place a waterproof paper label inside the bag legibly marked with park name, site name (e.g., Indian River - below barrier), species, date, and fish identification serial number. Ensure the field data sheet is filled out completely and properly cross-references the fish sample (Figure 2.5). Individuals in sealed plastic bags should be kept on ice and cool to the extent possible in the field. To maintain sample integrity and preserve the chemical signatures present in the fish tissues, samples must be placed in a -20°C freezer within a maximum of 8 hours.

If time in the field allows, measure the fork length and mass of fish that will be released back to the river and not retained for analysis.



Figure SOP-3.4. Example of clean handling station for fish processing.

3 Submitting, validating, and accepting Dolly Varden field collection sheets (EC_C)

For this deliverable, the complete sets of paper field collection sheets that have accumulated over the survey year for all sites are scanned into a single PDF. The PDF is submitted through the validation / quality assurance iterations until certified. It is stored in the repository and disseminated over the web.

1 Project leader (or delegate) tasks

1. Gather all of the field collection sheets that have been recorded during the field surveys for the year
2. Review sheets and fill in any missing information, if necessary
3. Arrange observer forms in chronological order (earliest sampling first)
4. Verify the set is complete. There should be at least one sheet for every sampled site. If a sheet is missing and cannot be found after diligent search, insert a sheet of paper in the stack stating the site name and “No Field Observer Form.”
5. Scan the entire packet into a single PDF file using a color scanner. Be sure the scanner is set for two-sided scanning.
6. Save the PDF on the SEAN network at
`\\sean.glba.nps.gov\Data\SEAN_Data\Work_Zone\EC\EC_C\yyyy\EC_C_yyyy.PDF`,
 where yyyy is the single year the samples were collected.
7. Request validation by sending a notification email to the Data Manager, specifying in the message body that deliverable EC_C, for year yyyy is ready; the Data Manager will know how to locate and work with the file named “EC_C_yyyy.PDF”.

2 Data manager tasks

1. On receipt of the submission, assign the next formal Submission Number to this file, as found in the master Submission_Log table.
 1. Use the “Update Submission Log” web tool at
http://sean-dm.glba.nps.gov//0_submission_update.aspx.
 2. Complete Submission_Log details up through the Submission_Date column.

2. Copy the file into the staging area for validation at a subdirectory named with the submission number in \\sean.glba.nps.gov\Data\SEAN_Data\Staging\EC\EC_C.
3. Validate the submission according to current criteria.
4. Record validation summary data in the Submission_Log using the web tool.
5. If submission fails mandatory criteria, reply with a “failure email” that includes:
 1. The submission number assigned
 2. The deliverable ID
 3. The protocol ID
 4. Documentation listing all the specific mandatory criteria failed
6. If submission passes mandatory criteria, reply with a “success email” that includes:
 1. The submission number assigned
 2. The deliverable ID
 3. The protocol ID
 4. Documentation listing any specific optional criteria failed
 5. Request to certify deliverable as complete

3 Project Leader Tasks

1. On receipt of a failure email:
 1. Review the paper stack is in chronological order.
 2. Rescan or edit the PDF to ensure it is in the proper form.
 3. Resubmit for validation.
 4. If failure cannot be resolved, email the Data Manager that the submission is withdrawn.
2. On receipt of a success email, review any failed optional criteria:
 1. The following tasks are the responsibility of the Project Leader and may not be delegated.
 2. If the review of failed optional criteria indicates the validated data are acceptable reply with a “certification email” stating the deliverable is accepted and may be disseminated.
 3. If the validated data are unacceptable:
 1. Reply with a “withdrawal email”, stating the deliverable is withdrawn.
 2. Take remedial action to obtain a corrected deliverable.
 3. Restart the process from the beginning.

4 Data Manager Tasks

1. On receipt of a withdrawal email:
 1. Mark the withdrawal in the Submission_Log’s Status column using the web tool.
 2. Terminate the process.
2. On receipt of a certification email:
 1. Sensitivity is highly unlikely for this deliverable. But if sensitive:
 1. Mark the sensitive designation in the submission status column using the web tool.
 2. Notify the submitter of the situation.

3. Complete the deliverable tracking spreadsheet cells referring to dissemination with the word SENSITIVE.
4. Do not attempt to install the sensitive item in the auxiliary repository.
2. If not sensitive:
 1. Install this file in the NPS Data Store under Project Environmental Contaminants using current practices. Typically this is done by cloning an existing EC_C reference, updating the clone's metadata, and uploading a new file.
 2. Also install this file on the NPS web sites in the ...\\AUXREP\\EC\\EC_C folder, make a web link for it, test and deploy it using current practices.
 3. Mark the certification in the Status column in Submission_Log using the web tool.
 4. Update the deliverable tracking spreadsheet milestones with the date of completion for EC_C and propagate it through the web sites using current practices.

4 Laboratory procedures

The SEAN does not have facilities for preparing Dolly Varden tissue or analyzing total mercury concentrations, so lab work is conducted by approved labs that meet the necessary standards for analysis that are comparable with previous sampling efforts.

Fish tissues must be prepared in a manner similar to Section 2.2 of Cyr et al. 2017. Importantly, viscera are removed from each individual fish to reduce the effect of recent dietary items and unabsorbed elemental mercury on measured total mercury tissue concentration. Total mercury analysis must follow EPA Method 7473 (SW-846) and reported as ng/g wet weight, using percent water calculated from samples during the drying process. In future years, if this method is no longer feasible or preferred, the project leader must consult with experts in mercury analysis to determine what current method is most comparable and appropriate with previous work conducted by the SEAN.

SOP 6 details the final reporting structure from the lab analysis, including spreadsheet structure for results served on the SEAN website.

5 Submitting, validating, and accepting Dolly Varden tissue mercury analysis laboratory technical reports (EC_D)

For this deliverable, a laboratory technical report detailing procedures, raw sample data, and accompanying data descriptions is provided to SEAN as a single PDF. The PDF is submitted through the validation / quality control iterations until accepted. It is stored in the repository and disseminated over the web.

1 Project leader (or delegate) tasks

1. Lab reports will most likely be sent electronically as a PDF. If the report employs some other medium, make a PDF file from it. Save the PDF on the SEAN network at \\sean.glba.nps.gov\Data\SEAN_Data\Work_Zone\EC\EC_D\yyyy\EC_D_yyyy.PDF, where yyyy is the single year the samples were collected.
2. Request validation by sending a notification email to the Data Manager, specifying in the message body that deliverable EC_D, for year yyyy is ready; the Data Manager will know how to locate and work with the file “EC_D_yyyy.PDF”.

2 Data manager tasks

1. On receipt of the submission, assign the next formal Submission Number to this file, as found in the master Submission_Log table.
 1. Use the “Update Submission Log” web tool at http://sean.dm.glba.nps.gov/0_submission_update.aspx.
 2. Edit in the Submission Log details up through the Submission_Date column.
2. Copy the file into the staging area for validation at a subdirectory named with the submission number in \\sean.glba.nps.gov\Data\SEAN_Data\Staging\EC\EC_D.
3. Validate the submission according to current criteria.
4. Record validation summary data in the Submission_Log using the web tool.
5. If submission fails mandatory criteria, reply with a “failure email” that includes:
 1. The submission number assigned
 2. The deliverable ID
 3. The protocol ID
 4. Documentation listing all the specific mandatory criteria failed
6. If submission passes mandatory criteria, reply with a “success email” that includes:
 1. The submission number assigned
 2. The deliverable ID
 3. The protocol ID
 4. Documentation listing any specific optional criteria failed
 5. Request to certify deliverable as complete

3 Project Leader Tasks

1. On receipt of a failure email:
 1. Rescan paper or edit the PDF to ensure it is in the proper form.
 2. Resubmit for validation.
 3. If failure cannot be resolved, email the Data Manager that the submission is withdrawn.
2. On receipt of a success email, review any failed optional criteria:
 1. The following tasks are the responsibility of the Project Leader and may not be delegated.
 2. If the criteria review indicates the validated data are acceptable reply with a “certification email” stating the deliverable is accepted and may be disseminated.
 3. Otherwise, when the validated data are unacceptable:
 1. Reply with a “withdrawal email”, stating the deliverable is withdrawn.

2. Take remedial action to obtain a corrected deliverable.
3. Restart the process from the beginning.

4 Data Manager Tasks

1. On receipt of a withdrawal email:
 1. Mark the withdrawal in the Submission_Log's Status column using the web tool.
 2. Terminate the process.
2. On receipt of a certification email:
 1. Sensitive information may not be disseminated. (Sensitivity is highly unlikely for this deliverable.) If sensitive:
 1. Mark the sensitive designation in the submission status column using the web tool.
 2. Notify the submitter of the situation.
 3. Complete the deliverable tracking spreadsheet cells referring to dissemination with the word SENSITIVE.
 4. Do not attempt to install the sensitive item in the auxiliary repository.
 2. Otherwise, when not sensitive:
 1. Install this file in the NPS Data Store under Project Environmental Contaminants using current practices. Typically this is done by cloning an existing EC_D reference, updating the clone's metadata, and uploading a new file.
 2. Also install this file on the NPS web sites in the ...\AUXREP\EC\EC_D folder, make a web link for it, test and deploy it using current practices.
 3. Mark the certification in the Status column in Submission_Log using the web tool.
 4. Update the deliverable tracking spreadsheet milestones with the date of completion for the EC_D and propagate it through the web sites using current practices.

6 Submitting, validating, and accepting Dolly Varden tissue mercury analysis results (EC_E)

For this deliverable, a laboratory technical report detailing all analytical results and the associated QA/QC procedures are provided to SEAN as a single computer file, preferably in directly usable form. The file is submitted through the validation / quality control iterations until accepted. It is stored in the repository and disseminated over the web.

1 Project leader (or delegate) tasks

1. EC_E is a comma separated value (CSV) data file. Lab reports may be sent electronically as a CSV, or as an Excel spreadsheet or in some other form. If the report employs some format other than CSV, produce a CSV file from it.
 1. An Excel sheet may be converted to CSV easily using the "file | save as" function.
 2. Other formats may generally be copied from the screen and pasted into Excel. The text may need to be parsed into columns using Excel's "data | text to columns"

function. Columns may also need to be formatted: the way the data appears on the Excel screen is exactly how it will be saved in the CSV.

3. If the resulting CSV file needs to be examined for form and content, it is best to use a text editor like Notepad rather than Excel. Excel's screen display may not exactly represent the CSV content.
4. Save the final CSV on the SEAN network at
`\\sean.glba.nps.gov\Data\SEAN_Data\Work_Zone\EC\EC_E\yyyy\EC_E_yyyy.CSV`,
 where yyyy is the single year the samples were collected.
2. Request validation by sending a notification email to the Data Manager, specifying in the message body that deliverable EC_E, for year yyyy is ready; the Data Manager will know how to locate and work with the file "EC_E_yyyy.CNV".

2 Data manager tasks

1. On receipt of the submission, assign the next formal Submission Number to this file, as found in the master Submission_Log table.
 1. Use the "Update Submission Log" web tool at http://sean.dm.glba.nps.gov/0_submission_update.aspx.
 2. Edit in the Submission Log details up through the Submission_Date column.
2. Copy the file into the staging area for validation at a subdirectory named with the submission number in `\\sean.glba.nps.gov\Data\SEAN_Data\Staging\EC\EC_E`.
3. Validate the submission according to current criteria.
4. Record validation summary data in the Submission_Log using the web tool.
5. If submission fails mandatory criteria, reply with a "failure email" that includes:
 1. The submission number assigned
 2. The deliverable ID
 3. The protocol ID
 4. Documentation listing all the specific mandatory criteria failed
6. If submission passes mandatory criteria, reply with a "success email" that includes:
 1. The submission number assigned
 2. The deliverable ID
 3. The protocol ID
 4. Documentation listing any specific optional criteria failed
 5. Request to certify deliverable as complete

3 Project Leader Tasks

1. On receipt of a failure email:
 1. Edit corrections into the CSV to ensure it is in the proper form.
 2. Resubmit for validation.
 3. If failure cannot be resolved, email the Data Manager that the submission is withdrawn.
2. On receipt of a success email, review any failed optional criteria:
 1. The following tasks are the responsibility of the Project Leader and may not be delegated.

2. If the criteria review indicates the validated data are acceptable reply with a “certification email” stating the deliverable is accepted and may be disseminated.
3. Otherwise, when the validated data are unacceptable:
 1. Reply with a “withdrawal email”, stating the deliverable is withdrawn.
 2. Take remedial action to obtain a corrected deliverable.
 3. Restart the process from the beginning.

4 Data Manager Tasks

1. On receipt of a withdrawal email:
 1. Mark the withdrawal in the Submission_Log’s Status column using the web tool.
 2. Terminate the process.
2. On receipt of a certification email:
 1. Sensitive information may not be disseminated. (Sensitivity is highly unlikely for this deliverable.) If sensitive:
 1. Mark the sensitive designation in the submission status column using the web tool.
 2. Notify the submitter of the situation.
 3. Complete the deliverable tracking spreadsheet cells referring to dissemination with the word SENSITIVE.
 4. Do not attempt to install the sensitive item in the auxiliary repository.
 2. Otherwise, when not sensitive:
 1. Install this file in the NPS Data Store under Project Environmental Contaminants using current practices. Typically this is done by cloning an existing EC_E reference, updating the clone’s metadata, and uploading a new file.
 2. Also install this file on the NPS web sites in the ...\\AUXREP\\EC\\EC_E folder, make a web link for it, test and deploy it using current practices.
 3. Mark the certification in the Status column in Submission_Log using the web tool.
 4. Update the deliverable tracking spreadsheet milestones with the date of completion for the EC_E and propagate it through the web sites using current practices.