New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB)

Standard Operating Procedure (SOP) for a

FISH CONSUMPTION ADVISORY DATA COLLECTION AND REPORTING

Approval Signatures

Elizabeth Stuffings Digitally signed by Elizabeth Stuffings Date: 2022.02.16 11:23:12 -07'00'

Elizabeth Stuffings — Date
Subject Matter Expert

Miguel Montoya Digitally signed by Miguel Montoya Date: 2022.02.16 11:44:27 -07'00'

Miguel Montoya — Date
Quality Assurance Officer

Kristopher Barrios Digitally signed by Kristopher Barrios Date: 2022.02.16 11:21:10 -07'00'

Kristopher Barrios — Date
Program Manager - Monitoring, Assessment and Standards Section

1.0 Purpose and Scope

The purpose of this procedure is to describe the data collection process for fish tissue used to determine the presence and concentration of environmental contaminants and subsequent issuance of public consumption advisories.

2.0 Personnel Responsibilities

Personnel who develop fish consumption advisories or perform data collection activities related to fish consumption advisories or supervise those who do, are responsible for implementing this procedure and signing the associated acknowledgment form for Standard Operating Procedure (SOP) 11.5 Fish Consumption Advisory Data Collection and Reporting.

The Monitoring, Assessment, and Standards Program Manager approves Field Sampling Plans (FSP) to conduct sampling at a predetermined location within a SWQB assessment unit and reviews updated or new fish consumption advisories. The Program Manager responsibilities also include reviewing and approving revisions to this SOP according to SOP 1.1 Creation and Maintenance of SOPs with assistance from the Quality Assurance Officer and Subject Matter Expert.

The Monitoring Team Supervisor determines the sampling team (at least one of whom must be on the sampling permit) for a fish consumption advisory sampling and ensures the team uploads fish data from the Fish Sampling Field Data Sheets into the SWQB Surface Water Quality Database (SQUID) and develops and/or updates recommendations for a fish consumption advisory, as necessary.

The Quality Assurance Officer (QAO) is involved in the development and revision of this SOP to ensure the SOP meets the requirements of the SWQB's Quality Assurance Project Plan. The QAO, with assistance from Subject Matter Expert, determines if any revisions to this SOP are needed at a minimum of every two (2) years in accordance with SOP 1.1 for the Creation and Maintenance of SOPs. Pending the review and approval of the document, the QAO will ensure the SOP is accessible through the SWQB's website. The QAO is also responsible for reviewing and approving FSPs for fish tissue data collection.

The Subject Matter Expert (SME) for this SOP is an Environmental Scientist within the Monitoring Team. The SME works with the Monitoring Team Supervisor to develop or update fish consumption advisories. The SME contacts the New Mexico Department of Game and Fish (NMDGF) every two years prior to fish sampling to request a renewed NMDGF Scientific Collection Permit. Processing time for the approval of permit applications may take up to 6 weeks, so field work should be planned accordingly. The SME also records all fish collections during the year on the NMDGF Annual Report for Scientific Authorization Permit and delivers the report to NMDGF by the reporting deadline of January 31 the year after the collections occurred). A Federal Scientific permit issued by the USFWS may also be required if sampling involves federally protected species; contact USFWS for more information. The SME also coordinates data collection activities with NMDGF, should no staff be qualified to obtain a NMDGF Scientific Collection Permit or NMDGF assistance is required.

The Fisheries Biologist for the project is responsible for fish species identification during the fish sampling process. Other responsibilities include, confirming sampling equipment is clean and functional,

completing the verification of all field sample sheets prior to leaving the field sampling location and ensuring the NMDGF and/or USFWS is contacted upon capture of a listed species. The fisheries biologist for each sampling event also uploads all pertinent data into SQUID. The Fisheries Biologist may be the same individual as the SME. Should the Monitoring Team not have a qualified Fisheries Biologist, these tasks (other than SQUID upload) must be coordinated with NMDGF.

3.0 Background and Precautions

3.1 Background

The Surface Water Quality Bureau (SWQB) conducts annual or semiannual fish collections to analyze fish tissue contaminants in water bodies of concern. Concentrations of contaminants in fish tissue are used to advise the public on consumption of safe amounts of fish (meals per month) based on EPA guidelines (USEPA 2000). Generally, SWQB collects fish via nets or electrofishing in waterbodies with significant angling pressure and reproducing populations of edible sport fish species. Site locations and rationales for data collection, contaminant analyses, and additional details must be documented in Field Sampling Plans (FSP).

3.2 Procedural Precautions

Site conditions or project-specific data collection objectives may necessitate the use of alternative field data collection procedures not included in this SOP. The use of field methods other than those presented in this SOP must be approved by the MASS Program Manager in coordination with the QAO, and alternative methods must be accurately documented on field forms.

Collection and analytical methods may vary depending on the water body being sampled and the sampling goals defined in the field sampling plan (FSP). The target taxa and maximum number of fish to be collected per site should be estimated in the FSP. Larger, adult fish should be collected as these are the fish that are typically consumed by the fishing public.

If tissue samples are to be analyzed by a contract laboratory, ensure the proper chain-of-custody procedures are followed. Follow proper federal regulations when shipping samples using dry ice.

Refer to SWQB Standard Operating Procedure (SOP) 8.1 Cleaning of Sampling Equipment for detailed equipment cleaning protocols and to ensure that all equipment are cleaned appropriately. Nets should be thoroughly rinsed and dried after each use, preferably in direct sunlight, as ultraviolet radiation helps kill bacteria. To prevent the transmission of pathogens or non-native taxa, thoroughly clean sampling equipment before proceeding to another water body.

3.3 Safety Precautions

Field staff should exercise their professional judgment regarding all sampling conditions and whether to begin or continue traveling to a field site or conduct sampling. Field staff should not

risk traveling to remote sites during weather events such as severe monsoon rainstorms or snowstorms and should not sample during nearby thunderstorms. Sampling should be rescheduled or delayed to accommodate unsafe conditions.

When electrofishing, it is strongly recommended that non-conductive gloves of adequate length are worn by all participants to prevent electrical shock. Also, care should be taken to ensure that waders used do not conduct electricity and have no leaks. Consideration should be given to stream flow conditions to ensure safe working conditions. All activities requiring the use of a boat must adhere to boating safety protocols.

Staff should use best professional judgement to assess risks involved with data collection. Refer to SWQB's JHA for further safety precautions when conducting field work.

Boating Safety Precautions

These boating safety precautions apply to SWQB employees that use any type of watercraft in furtherance of fish sampling. Watercraft must always be operated with safety as the primary requirement and in accordance with recognized federal, state, and local laws and standards. All personnel operating and working aboard watercraft must have completed a U.S. Coast Guard approved boating safety course. Do not operate watercraft in hazardous weather conditions such as thunderstorms or high winds/rough water. If weather conditions become hazardous while out on the water, sampling must cease and you must return to boat ramp as safely as possible. All personnel should wear US Coast Guard type lll personal flotation devices (PFD) while on board watercraft. While working with nets onboard a boat always work from the bow to ensure nets are kept away from the boat motor at all times.

Stream/River Wading Safety Precautions

Wading across a stream bed can be very dangerous depending on flow and substrate conditions. Do not attempt to wade into a stream if the depth (in ft) multiplied by the velocity (in ft/s) equals or exceeds 10 square feet per second (ft^2/s). For example, a stream that is 2 ft deep and has velocities of 5 ft/s or more, should be considered too dangerous to wade. If you unknowingly start to begin sampling and discover part of the way across that you violate this rule ("the rule of ten"), return to the nearest bank and note "too fast/deep to measure/sample" on the field form. Do not attempt to wade a stream if you feel it is unsafe, regardless of the outcome of the "rule of ten." Some wadeable streams may be unwadeable during spring runoff but will be wadeable when base flow resumes.

Electrofishing Safety Precautions

It is highly recommended that all personnel who perform electrofishing should be electrofishing certified (or have sufficient experience operating an electrofishing unit), as well as CPR and First Aid certified, as indicated in the SWQB JHA for sampling.

Procedures and responsibilities to be considered when electrofishing are:

- Electrofishing should never be performed alone. Ideally, three field staff will be available to assist; One person to wear the backpack unit, one person to net fish, and one person to carry a bucket.

- It is the responsibility of individual electrofishing crew members to ensure that they have the proper waders (e.g., waders that do not conduct electricity or leak), wading boots, gloves (i.e., non-conductive gloves of adequate length) and any other required personal protective equipment.

- It is be the responsibility of the electrofishing Fisheries Biologist(s) to instruct other crew members on the safety procedures and potential hazards in electrofishing before the electrofishing field effort is undertaken.

- The person operating the electrofishing unit must alert all electrofishing crew when the unit is turned on and active electrofishing begins. If at any time a crew member requests that electrofishing cease, the operator must immediately cease electrofishing and inform the crew as such. The operator cannot resume actively electrofishing until informed it is safe to do so and has alerted all crew that electrofishing is resuming.

- Electrofishing operations must be discontinued if a crew member feels electroshock through gloves or waders. Replace or repair gloves or waders to eliminate electroshock.

- Discontinue electrofishing if anyone outside of the electrofishing team approaches within 30 feet (for backpack operations) or 100 feet (for all other electrofishing operations).

- The electrofishing Fisheries Biologist must advise their Supervisor or Program Manager of the location and time the electrofishing will be performed. The Project Lead must advise his/her Supervisor or Program Manager as soon as practical after the electrofishing has been performed that the job has been completed.

4.0 Definitions

Composite – a group of several individual fish (usually three or more) from the same location and of the same species and size class from which an equal mass of tissue is taken from each, blended, and analyzed as one sample.

Electrofishing – The process of capturing fish from a stretch of water using a weak electric field, often using a backpack or boat-mounted device.

Field Sampling Plan (FSP) – A document that provides guidance for all fieldwork by defining in detail the sampling and field data-gathering methods as well as resource requirements for the project.

Fisheries Biologist (SWQB) – A person with biological training that that is qualified in fish identification and collection methods and has obtained a valid New Mexico Department of Game and Fish Scientific Collections Authorization Permit.

Program Manager – An individual within the SWQB that manages a program such as the Monitoring, Assessment and Standards Section (MASS).

Quality Assurance Officer (QAO) – An individual within the MASS responsible for overseeing the development and implementation of all quality assurance procedures and processes within the SWQB including external projects that receive support or funding from the SWQB.

Quality Assurance Project Plan (QAPP) – A formal planning document for environmental data collection activities that describes the data collection procedures and the necessary quality assurance and quality control activities that must be implemented to ensure that the results are sufficient and adequate to satisfy the stated performance criteria.

RID – A laboratory request ID. This is a unique number and barcode assigned to each sample or sample composite. RID stickers contain both the number and barcode and can be adhered to the sample container and the field datasheet. The RID is the reference number that allows each analyte result to be linked back to the original sample and entered into the database.

Standard Operating Procedure (SOP) – A document that lists the steps that should be completed when doing a task.

Subject Matter Expert (SME) – A person who is familiar with the purpose and procedure for accomplishing a task.

Surface Water Quality Information Database (SQUID) – The SWQB database for storing, retrieving, and reporting environmental results, including biologic assemblage data and fish consumption advisory sampling events and data.

Surface Water Quality Bureau (SWQB) – A Bureau under the Water Protection Division of the New Mexico Environment Department. The SWQB's mission is to preserve, protect, and improve New Mexico's surface water quality for present and future generations.

Trammel Net – A gill net for capturing fish consisting of three layers of netting in different mesh sizes, which form pockets that entrap fish.

5.0 Equipment and Tools

Equipment and supplies needed to conduct the procedures outlined in this SOP are listed below. Supplies needed for a specific project will depend on the number of sampling sites and number of fish to be collected, an estimate of which should be indicated in the study plan or field sampling plan (FSP). Estimates for fish can be based on previous collections in each particular water body, as well as the analytes of concern and amount of funding allocated to the project.

Lentic (Lakes) sampling equipment:

- Boat/boating safety equipment
- Trammel nets
- Weights (for trammel nets)

- Floats (for trammel nets)
- Gloves for handling spiny fish
- Wire cutters for cutting fish barbules and spines entangled in nets
- Measuring board
- Coolers
- Ice
- Valid sampling permit
- Fish Sampling Field Data Sheets

Streams sampling equipment:

- Electrofishing unit, batteries, anode and cathode etc.
- Electrofishing safety equipment (waders, gloves etc.)
- Seines
- Hoop nets
- Bait for hoop nets
- Buckets
- Measuring board
- Coolers
- Ice
- Valid sampling permit
- Fish Sampling Field Data Sheets

Sample preparation and shipping equipment:

- Fillet knife(s)
- Knife sharpener
- Aluminum foil
- Scale (digital food scale works well) for measuring fillet sample wet weights
- Fish Tissue Contamination Field Data sheets
- RID stickers
- Sharpie for labeling samples and sample composites
- Plastic Ziploc bags (freezer quart or gallon)
- Blue ice packs or dry ice (as applicable)
- Dry ice shipping container/insulated shipping container
- Packing tape
- Chain-of-custody (COC) record for laboratory
- FedEx Priority Overnight shipping form

6.0 Step by Step Process Description

6.1 General Sampling Information

Tissue collections for fish consumption advisories are most often conducted in lentic waters (lakes or reservoirs, however fish are occasionally collected from streams or rivers using a backpack or boat-mounted electrofishing unit.

Collaboration with other agencies (e.g., NMDGF, USFWS, BLM) should be considered when necessary or desirable. Tissue collection for fish consumption advisories is sometimes done with the assistance of New Mexico Department of Game and Fish (NMDGF), especially if the sampling effort will require the use of a boat-mounted electrofishing unit.

It is preferable to have the compositing or reduction of whole fish performed by the contracted analytical laboratory.

6.2 Sampling Sites and Season

When collecting specimens for fish tissue consumption advisories, it is desirable to target waters where public fishing pressure is highest and/or where known or suspected contamination issues occur. Furthermore, it is desirable to sample during a season when fishing pressure is highest (usually late spring or summer depending on the water body), but as a matter of efficiency sampling is sometimes coordinated to align with NMDGF sampling efforts or to occur in conjunction with SWQB watershed surveys. Sampling should also be planned to accommodate at least 4-6 weeks for results to be returned from the analytical laboratory, depending on hold times and analytical suite.

6.3 Equipment

SWQB typically uses trammel nets for lentic waters and backpack electrofishing units for fish consumption advisory sampling in lotic waters. NMDGF usually employs a boat-mounted electrofishing system for lakes and reservoirs, and may have the ability to sample non-wadeable rivers with a boat-mounted electrofishing system as well. The SWQB is unable to sample large rivers requiring non-wadeable sampling methods without the assistance of agencies possessing a boat-mounted electrofishing system. Other passive (e.g., hoop nets, traps) or active (e.g., seines) fish collection devices can be used as well. For a complete list of sampling and processing equipment and tools based on water body type being sampled see section 5.0 Equipment and Tools.

6.4 Sampling and Processing

Fish tissue samples and/or whole fish may be provided via other collection agencies, in which case the below sampling methods (section 6.4.1) may not apply. All fish provided by external agencies (e.g., NMDGF, BLM, USFWS or any other federal or state agency authorized to collect fish) must be accompanied by sampling location, date/time, and fish species and total lengths information. All fish obtained externally must be in good condition and tissue must be put on ice immediately following sampling to prevent tissue degradation.

Because fish tissue is collected for analysis under the New Mexico Fish Consumption Advisory program, there is usually little or no need for water quality, population, or habitat data collection. The Fish Tissue Contamination Field Data form (see “related SOP forms”) is populated with data such as the location, date/time of collection, field staff, fish species and total length.

6.4.1 Tissue Collection for Fish Consumption Advisory – Sampling in Wadeable Streams and Lentic Waters

Sampling in Wadeable Streams

Backpack electrofishing (when and where conditions permit) is usually the most efficient means of collecting a sufficient sample size of fish in wadeable streams. Seines may also be used when necessary. Mesh size of dip nets and seines can be larger than those required for bioassessments, as larger fish are targeted for contaminant analysis. Block nets or natural migration barriers are unnecessary but may facilitate capture. Shock seconds and other similar metadata do not need to be recorded. The sampling effort should target species and size classes that are commonly consumed from freshwater streams, for example Brown Trout. It is not recommended that sampling efforts target species from a "put and take fishery" (i.e., stocked triploid Rainbow Trout) for capture and analysis, as these fish do not persist in the stream for the extended periods of time sufficient to bioaccumulate contaminants in tissue in levels that would be of concern for human health. The majority of Rainbow Trout present in New Mexico streams are stocked, however some of these fish, especially those present in larger stream or river systems may have persisted for several years before capture and may be appropriate for tissue analysis. Recently stocked fish are often evident by missing or torn fins and pale or absent coloring.

Sampling in Lakes and Reservoirs

When sampling in lentic waters (lakes and reservoirs) trammel nets are preferred over gill nets, as gill nets tend to catch a smaller range of sizes of fish and result in a higher mortality rate. Trammel nets should have a large size outer mesh (e.g., 300 mm or 12-inch square) and small size inner mesh (e.g., 40 mm or 1.5-inch square) to maximize the size range that may be effectively caught. Fine twine size (e.g., #139) for inner mesh is more difficult for fish to detect, thus increasing catch results. Net depth should be at least four feet, preferably six feet. Length should be 50 to 100 meters, unless specific circumstances dictate the use of a shorter net. For most purposes, nets should be designed to rest on the bottom (as opposed to floating from the surface). Anchor weights for the nets may be fashioned from three-pound coffee cans filled with concrete with an eyebolt embedded in the concrete (a washer fastened to the threaded end of the eyebolt will prevent it from pulling out). During deployment, nets should be stretched lengthwise and should have adequate slack in the line attached to the surface floats to prevent wave action from lifting the anchor weights and allowing the ends of the net to gradually move toward each other. Nets are typically set in the afternoon and returned to the next morning to remove the catch. Depending on the lake size and productivity, one to three 50-meter nets should be deployed and left set overnight. Fish species are composited from the nets to form the samples to represent the whole lake. The SWQB designated deep station of the lake is used as the station to represent the entire lake, and the deep station for the lake is where associated fish consumption advisory data is stored in the SWQB database (SQUID).

Detailed Procedure for Sampling using a Trammel Net

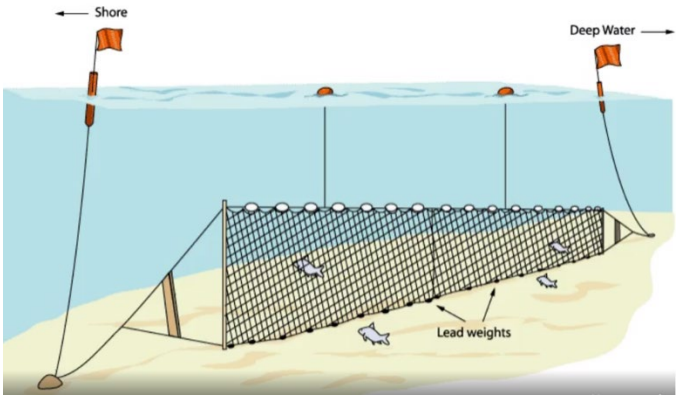
A trammel net is specifically designed with a lead, a float line, and four locations to hook on anchors and float markers. The lead line sinks and holds the net to the bottom and the float line keeps the top of the net at the surface. This maximizes the surface area of the net and keeps the net stretched taut. Store trammel nets in baskets with the net fed into the basket in a circular

motion around the bottom of the container. Keep both the lead line and the float line together but prevent them from twisting to ease deployment of the net. Store the net without floats or anchors attached.

Prior to sampling using a trammel net, ensure that nets are free of holes, loaded correctly into the storage containers and both lead links and floats are present. Determine timing of sampling based on the species of fish (i.e., diurnal vs. crepuscular vs. nocturnal fishes). Nets should be set to reflect the optimal timing of catching target species. Nets may be set in the late afternoon and left overnight but avoid letting nets sit unattended for extended (>18 hrs.) periods of time as mortality and catch may be substantial and/or overwhelming. Determine location of sampling based on fish target species by setting nets either near shore or in deeper waters.

Deploying the net:

1) Approach the area where the net will be set. If deploying nets near shore, the driver of the boat should get the nose of the boat up near shore, watch the depth finder and trim up the motor if the water gets too shallow. Crew members deploying the net will hook the anchor weight and float line to the end of the net.
2) Clip the anchor weight rope to the anchor weight and the float line to the float. Drop the anchor weight and float marker near shore and begin reversing the boat slowly. Feed out the net as it is pulled from the storage basket, ensuring that the lead line and float lines do not twist. As the end of the net nears, attach the float marker to the float line clip and the anchor weight rope to the lead line clip. Ensure that there is tension in the net and keep the lines separated while keeping tension to keep them from twisting. Drop the anchor weight and float line in separate directions to keep them from crossing over. The below figure illustrates a properly set net. Note: if clips/carabiners are not available, simply use knots to secure the lead line rope to the anchor. Put a loop in the float line rope and slide the anchor rope through this loop and attach the float at the end. This will allow the anchor weight to settle on the bottom of the lake and an appropriate amount of rope for the float to hold the net straight up and down from the bottom of the water to the surface without allowing slack that could allow the net to move or become tangled.



3) Let the net sit for several hours or overnight depending on fish target species and target numbers, lake productivity, net set location etc.

4) Return to the net, locate the float marker, and pull in the net. Remove the anchor weight and

continue pulling in the net, feeding it into the basket in a circular motion as mentioned before so the net is ready to set again.

5) As the net is pulled in there will likely be fish caught in the net. Begin removing fish from the net, pushing them through the mesh and pushing from their tail over their head. Trammel nets have an inner and outer "pocket" that fish get caught in. Remove one layer of net from the fish at a time and untwist as necessary. Once the fish is entangled in only one layer of netting, find the opening to the "pocket" on the other side of the net and reach in to retrieve the fish. Avoid cutting the net unless necessary. Removing barbules from catfish and spines from carp using clippers may be helpful. Release all fish that are not being kept as quickly and efficiently as possible in a location furthest away from the portion of the net still in the water. Store all captured fish on ice in the field and freeze as soon as possible.

   Upon returning from the field, remember to properly disinfect all field gear (waders, boots, live wells, etc.) per SOP 8.1. Nets should be dried thoroughly in direct sunlight to kill all organisms and prevent transmission between waterbodies.

6.4.2 Processing Fish for Tissue Samples and Laboratory Submittal

Keep fish to be used for analysis in a cooler on ice while in the field. Upon returning from the field, freeze fish that are not immediately filleted or composited. Freeze fish fillets (or whole fish) until analysis.

For studies pertaining to wildlife, whole fish are used. For studies relating to human consumption, fish fillets should be used. It is preferable to have the compositing or reduction of whole fish performed by the contracted analytical laboratory. Filleting should be performed on a clean surface that is rinsed between each individual fish to avoid cross contamination. Those species of fish that are typically eaten without the skin should have the skin removed. Some species (e.g., salmonids, catfish) may have the skin left on, if that is how they are typically eaten. Retain the belly flap fat on each fillet. Individual fish are identified to species by a qualified fisheries biologist and measured (total length, tip of nose to tip of tail). This information is recorded on the appropriate form (Fish Tissue Contamination Field Data form).

Composite samples are always of one species from one water body, and a single size class should be included in any given composite. Size classes for reporting a fish consumption advisory are as follows: <10 inches, 10-14 inches, 14-18 inches, 18-22 inches, 22-26 inches, 26-30 inches, 30+ inches. Creating an excel spreadsheet with the fish identifiers (e.g., Channel Catfish 1) and total lengths may be helpful for mapping out possible composite combinations based on size classes.

Filleting:

Ensure fillets are of adequate size for each analysis required from the sample. Pesticides and methyl mercury require 4-5g of tissue while PCB congeners require up to 20g of tissue per individual or composite. When unsure about fillet size, err on the side of caution and provide a larger fillet than may be necessary, keeping in mind weight increases shipping costs and

decreases space for other samples. Consult with the analytical laboratory for additional fillet size requirements.

Fish tissue composites:

A fish composite sample should consist of at least two fish that met the following criteria:

1. All fish in the composite sample are of the same species.
2. The fish species in the composite sample is commonly consumed by people.
3. All fish in the composite sample either meet legal requirements of harvestable size for the sampled waterbody or are at least of consumable size.
4. All fish in the composite sample are similar in size, so that the smallest fish in the composite sample is not less than 75% of the total length of the largest fish in the composite sample.
5. All fish in the composite sample were collected at the same time.

Fillets designated as part of a composite sample will be homogenized at the analytical laboratory. The homogenized fillet composite samples will be divided into fillet tissue aliquots containing equal masses of adequate tissue for each type of chemical analysis.

Complete a laboratory chain-of-custody form and submit samples for contaminant analyses, as documented in the FSP. The sample chain-of-custody forms demonstrating analysis required for these methods are available in the SOP "associated forms" folder on the server.

Hold times:

Hold times may vary on method and laboratory preference. Contact the laboratory to determine appropriate hold times. Tissues should be re-frozen immediately after filleting, wrapped in aluminum foil, and stored in a plastic bag. Frozen samples should be shipped as soon as possible. The following hold time guidelines, provided by the analytical laboratory, should not be exceeded, if possible.

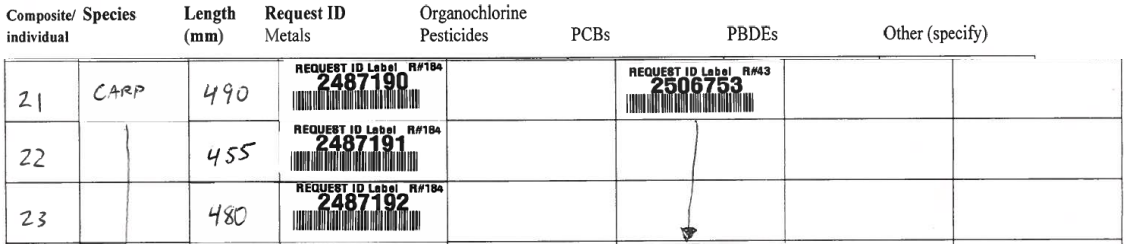
Organochlorine Pesticides (DDT and DDE) – 1 year if frozen
Methylmercury – 6 months if frozen
PCB congeners – 1 year if frozen
Selenium – 6 months if frozen

Contact the analytical laboratory for the hold times for other analytical parameters.

Preparing samples for Shipment:

Composite samples should all be assigned the same Request ID (RID) number on the Fish Tissue Contamination Field Data sheet. RIDs (barcode sticker or written out) should be recorded under the correct analyte column associated with the row of the composite or individual fish within that group. Below is an example of a composite sample of three carp (within a 455-490 mm size range), all assigned the same RID to make up the composite sample for PCBs. Separate RIDs are assigned for individual metals analyses for the same fish. In the example below, the laboratory

will require enough tissue from Carp 21-23 to create a composite sample for Metals, as well as individual analyses for PCBs.



Composite/ individual	Species	Length (mm)	Request ID Metals	Organochlorine Pesticides	PCBs	PBDEs	Other (specify)
21	CARP	490	REQUEST ID Label R#184 2487190			REQUEST ID Label R#43 2506753	
22		455	REQUEST ID Label R#184 2487191				
23		480	REQUEST ID Label R#184 2487192				

Wrap each individual fillet in aluminum foil (shiny side away from the fish's skin) and place those fish to be composited together in a plastic bag labeled with the species and the RID. Place the foil-wrapped fish on ice or back in the freezer as soon as possible. Ship samples on either a Monday, or Tuesday as this will ensure that they do not get held up by a courier over a weekend and risk sample degradation. When using freezer packs in shipments, 'blue ice' is always preferred to water ice. Dry ice may be necessary or appropriate in some cases. Always check with the lab prior to shipping to determine the preferred shipping method and to ensure the proper chain-of-custody procedures are followed. Cryogenic samples must be sent on dry ice or in a liquid nitrogen dry shipper. Follow proper federal regulations when shipping samples using dry ice.

6.5 Development of Fish Consumption Advisories

A fish consumption advisory will consist of a recommended number of meals per month for each species and size class in each water body sampled. Advisories should be updated or checked at least annually to reflect new data, or changes to advisory reporting. The SWQB fish consumption advisories and associated information can be found here: https://www.env.nm.gov/surface-water-quality/fish-consumption-advisories/.

To assign a recommended limit of meals per month of a given fish species and size class (by waterbody), each fish species from each location is divided into size classes. Size classes are in four-inch increments: <10 inches, 10-14 inches, 14-18 inches, 18-22 inches, 22-26 inches, 26-30 inches, 30+ inches). The concentration of a given contaminant of each individual and/or composite is averaged for each size class. The result is compared to the consumption limit tables provided in Chapter 4 of the EPA guidance document (USEPA, 2000). If the recommendation results in more than 4 meals per month, no advisory is issued.

Total DDT and total PCBs are compared to the non-cancer health endpoints. EPA guidance for monthly fish consumption limits for noncarcinogenic and carcinogenic health endpoints for DDT are found in Table 4-7 of the EPA Risk Assessment and Fish Consumption Limits handbook (USEPA 2000).

EPA guidance for monthly fish consumption limits for noncarcinogenic and carcinogenic health endpoints for PCBs (total) are found in Table 4-24 of the EPA Risk Assessment and Fish Consumption Limits handbook (USEPA 2000). Contaminant concentrations that fall within 4 meals per month or less are included in the fish consumption advisory.

The most common metal test in fish tissue is methylmercury which does not have cancer health endpoint guidance. Instead, the recommended number of meals per month for consumption advice for mercury-contaminated fish is intended to protect children and pregnant or nursing women from adverse acute or chronic health effects. EPA guidance for monthly fish consumption limits for Noncarcinogenic health endpoints for methylmercury are found in Table 4-3 of the EPA Risk Assessment and Fish Consumption Limits handbook (USEPA 2000).

When developing the updated yearly fish consumption advisory for the public, list all contaminants that are found at levels high enough to warrant an advisory instead of any one contaminant that results in the most stringent advisory. For example, if there is a recommended number of meals per month ≤ 4 for both mercury and DDT, the advisory will list both contaminants as the parameter of concern using the most stringent number of meals per month out of the two parameters as the guidance. When developing updated advisories, new data for a species will overwrite and supersede all previous data for that species within that water body and a new advisory will be issued accordingly. If new data for a species are not available, the previous advisory shall remain in place. This process ensures that data is collected and updated with some regularity and ensures that decades-old data does not remain present in advisories even if a specific size class was not most-recently captured to compare to existing data. SWQB may remove old (issued >12 years prior to the latest advisory) advisories if no new data is available for a species after re-sampling following the procedures listed in this SOP, and NMDGF has verified the species is no longer present in the water body.

Following Monitoring Team Supervisor and MASS Program Manager review of the updated advisory, the Program Manager will send the revised FCA chart to contacts at the NMDGF and NMDOH, and coordinate publication of the new advisory to the SWQB website.

7.0 Data and Records Management

Upon processing tissue samples, record data on the Fish Consumption Advisory field data form. Transfer these data (date of capture, location, field staff, capture method, fish species, length, assigned identification number, analytes, composite structure if necessary, etc.) to a spreadsheet. Once lab results are received, associate the results with individual fish and/or composites. Verify these data before permanent archiving of the spreadsheet.

Fish tissue data are stored in SQUID much the same way that water chemistry data are stored. Create a sampling event (choose “Fish Tissue” from the drop-down menu), indicating date and location, staff present, etc. Enter the information from the field data form into the event, including fish species, analyte suite, number of fish per composite (individual fish are considered a composite of one), and length of each fish. Each RID is then associated with its appropriate composite and analyte suite (i.e., there is one RID per composite per analyte suite). Upload the analytical results from the laboratory similar to the method used for water chemistry results (Data Management/Imports/SLD Results). For lake sampling the designated deep station of the lake is used as the station to represent the entire lake, and the deep station for the lake is where associated fish consumption advisory data is stored in the SQUID.

When assigning RIDs to their appropriate composites, after entering species, analyte suite, number of fish per composite, and length of each fish, generate a Fish Tissue Metadata report from SQUID. Use the report to ensure each RID is assigned to its appropriate composite.

Processed data spreadsheets are archived on the SWQB server, organized by year and location.

Maintain a file for documenting advisory changes, (a "record of decision") for advisories that are lifted, new advisories due to new data, etc., and store the record in the Fish Consumption Advisory folder on the server. As each change occurs, document water body, date of change and date of new samples, reason for change, and whether the change was implemented in the public webpage advisory, IR list, and NMDGF proclamation.

8.0 Quality Control and Quality Assurance

The SWQB maintains consistency for data collection activities related to fish consumption advisories and the development of fish consumption advisories by requiring staff responsible for implementing this procedure to sign the associated acknowledgment form for SOP 11.5 Fish Consumption Advisory Data Collection and Reporting.

Quality Control procedures associated with chemical analysis are performed by the analytical laboratory as part of the tissue analysis procedure.

Data and metadata that are transferred from the field forms to the spreadsheets stored in SQUID are verified, and metadata associated with the sampling event created in SQUID are also verified. A Fish Tissue Metadata report is used to verify that appropriate RIDs were assigned correctly. Results from the analytical lab that are transferred to spreadsheet and used to develop advisories are similarly verified.

9.0 Related Forms

Fish Tissue Collection checklist
Fish Sampling Field Data Sheets

10.0 Revision History

• Revision 0. July 19, 2010. Original.
Jodey Kougioulis, QAO; Gary Schiffmiller, SME; James Hogan , Program Manager MASS

• Revision 1. February 16, 2022. Format change to SOP; updated format to be consistent with SOP 1.1. Major updates to Personnel Responsibilities, Background and Precautions, Definitions, Equipment and Tools, Step by Step Process Description, Data and Records Management, Quality Control and Quality Assurance, Related Forms, and References.
Miguel Montoya, QAO; Elizabeth Stuffings, SME; Kris Barrios, Program Manager MASS

11.0 References

USEPA. 2000. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 2: Risk Assessment and Fish Consumption Limits, Third Edition. EPA 823-B-00-008. Washington, DC.

U.S. Geological Survey (USGS). 1993. Requirements for Water Resources Division Personnel Performing Electrofishing, USGS Memorandum No. 93.19. February 24.