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Sea Lamprey Control Centre
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ADMINISTRATIVE OPERATING PROCEDURE

PROCEDURE TITLE:

Quality Assurance (QA) Measures Utilized in the Sea Lamprey Control Program in Canada and the United States

APPLICABILITY:

These QA measures apply to procedures used in the chemical control of sea lampreys conducted by personnel of Fisheries and Oceans, Canada, the U.S. Fish and Wildlife Service, and the Lake Champlain Fish and Wildlife Management Cooperative.

PURPOSE:

The purpose of these QA measures is to insure that data generated by workers are accurate and reliable. Conformance to the training standards and operating procedures outlined in this document guarantees that personnel from all lampricide control units conduct operations by similar, proven, and accepted methods.

PROCEDURE:

This synopsis outlines the steps taken to assure and to document that day-to-day functions in the chemical control of sea lampreys are conducted properly. The primary areas addressed in this document include training in instrument operation and in standard procedures used in field work; documentation of work; use, handling, and storage of analytical standards; and procedures for operating instruments and for conducting lampricide treatments. The **TRAINING** section outlines the in-house training offered to workers. The **DOCUMENTATION** section describes applicable record keeping procedures which include the use of log books for instruments. All facets of the use and storage of analytical standards are covered under **STANDARDS**, and analytical methods are included under **OPERATING PROCEDURES**.

I. Training

The following training is offered to lampricide control workers. Specific types of training are required for individuals performing certain functions. Only training which supports working skills is included in this section. Other forms of training which support skills not directly related to data collection or lampricide control are not included.

A. Water chemistry

The measurement of pH, total alkalinity, and dissolved oxygen are covered in this session. Both measurement and documentation procedures are addressed in detail. Instruments are demonstrated that include pH meters, dissolved oxygen meters, and digital titrators. Each person conducts measurements according to protocols. Documentation is explained which includes the use of instrument log books and data collection forms. Completion of the training session is documented.

B. Toxicity testing

A limited number of workers participate in detailed instruction on toxicity testing. Additional personnel receive limited introduction. Flow-through test procedures are demonstrated and explained. Data records are extensive, so attention is paid to completing all forms accurately. Principles of toxicity testing and diluter function are reviewed annually, and all procedures are demonstrated. Updates and revisions of protocols are reviewed at the beginning of the field season.

C. Spectrophotometry

All personnel responsible for conducting analysis of water samples for TFM content during lampricide applications or toxicity tests receive instruction in spectrophotometric methods. Function of the spectrophotometer is explained fully. Procedures include formulation of standard solutions, construction of standard curves, collection of samples, analysis for TFM, and documentation including recording of data and completing the instrument log book. Individuals demonstrate their ability to conduct analyses for TFM with the spectrophotometer.

D. High performance liquid chromatography

A limited number of individuals who are required to conduct analyses for lampricides by high performance liquid chromatography receive training annually. Training focuses on theory of function and application, operation, analysis procedures, maintenance, and troubleshooting. Workers demonstrate their ability to prepare the instrument for analysis, program and calibrate the data system, and conduct analyses. Instruction also is provided in recording data and entering information in the instrument log book.

E. Fluorometry and dye application

A training session for operation of fluorometers is presented to field personnel who are required to use the instrument for dye studies. The instrument usually is used only to determine presence/absence of dye, so the depth of instruction is rudimentary. Working features of the instrument are introduced, and the instruction manual is followed to demonstrate the procedure. An experienced

operator assists trainees during their first field assignments with the fluorometer.

F. Lampricide application

Personnel who apply lampricides are instructed in the operation of all equipment used in applications. An experienced operator demonstrates the equipment and procedures used for applications at a stream-side location. Trainees are instructed in setting up feeder apparatus, handling lampricide, conducting feed rate changes, keeping records, washing cans, and using all safety equipment. After instruction, the operator trainees are required to demonstrate their abilities to conduct lampricide applications. Experienced applicators accompany trainees during their first several assignments.

G. Discharge measurement

Personnel responsible for conducting measurements of stream discharge are presented a preliminary overview of the three types of meters in use. Hands-on, stream-side instruction then is given to each person by an instructor experienced in conducting stream discharge measurements. Additional instruction is given on important points such as conducting function checks on the meters, completing calculations of stream discharge, and selecting locations to conduct discharge measurements.

H. Operation of automatic water samplers

Training in the operation of automatic water samplers is conducted in the field. Several types of samplers are used to collect water samples during treatments, so basic training is limited to functions and procedures common to all types including replacing batteries, planning deployments, and locating sampling sites. Specific, detailed instructions are located on each of the instruments. Experienced operators demonstrate methods of entering operating parameters.

I. Certification of pesticide applicators

Personnel applying lampricides are required to pass certification examinations. Reference material is provided to each person for study. Employees are allowed time to study the material and complete the test. Training and guidance are given to those who request it.

II. Documentation

A. Training

A record of training is maintained for each person participating in lampricide control field operations. This record, kept by the Treatment Supervisor at each facility, lists training provided to all lampricide control employees (AOP:004.x). In addition, a second record lists specific procedural training received by each person (AOP:004.x).

B. Instrument Use (Log Books)

The use and maintenance of analytical instruments is documented in log books assigned to the instruments. The instrument paired with each log book is described by type, manufacturer, property number, model number, unit number, serial number, and location. Log books contain sections which include an identification page, operation and maintenance pages, operating instructions,

and operator identification page. The log books remain with the instruments at all times. Instrument log books are assigned to pH meters, chromatographs, dissolved oxygen meters, spectrophotometers, and automatic water samplers. Specific procedures are followed when making entries in log books. All personnel trained and qualified to operate an instrument sign and initial the operator identification page. An entry is made in the operation and maintenance section each time the instrument is used or maintenance is conducted. All entries are made in ink, preferably black or blue. If an entry line is skipped a single line is drawn through the entry spaces. Mistakes are not erased but are crossed out with a single pen stroke, initialed, and corrected. New pages may be added to a log book, but old pages are not discarded. All pages remain in the log book until the instrument is retired. The log book is archived when an instrument is damaged beyond repair or retired from service.

C. Data Collection

All data collected during field operations is recorded on standardized data forms. Specific data collection forms include **Water Chemistry, Lampricide Analysis, Discharge Measurement, Dye Study, Lampricide Application, Granular Bayluscide Application, and Backwater Lampricide Application** (Appendix M). In addition, a series of forms are used to record data from on-site toxicity tests (Appendix M). The forms are organized to allow the data to be easily transferred to computer data files. Transcription of the data is conducted as time allows, if possible, on the day of data collection. Forms are stamped "ENTERED" to prevent duplicate entries into data files. Original data forms are retained after data entry.

Data are recorded in ink; however, pencil is acceptable if data forms are used in wet conditions. Entry errors are crossed out with a single pen stroke, corrected, and initialed.

D. Vendor Purity Analysis

Vendor batches of lampricides are analyzed to verify the percent active ingredient and purity (TOP:027.x).

E. Standards

A number of documents are used to record the formulation of field standards, trace the route of possession, and confirm the concentration of the standards (TOP:019.x).

1. **Certificate of formulation:** This document states the concentration of TFM in field standards (identified by lot #) supplied annually to SLC. Also included in this statement are the date of preparation, date of transfer, a description of the parent field formulation, and a description of the technical grade material against which the concentration of the standard was checked.
2. **Statement of confirmation:** This statement confirms that the concentration of TFM in a field standard has been checked and found accurate as claimed.
3. **Statement of transfer:** This statement provides documentation of the chain of possession of the field standards. This document includes the date of transfer, volume of standard involved, and code numbers for the

samples of standard. The statement is signed by all individuals involved in the transfer of the field standards.

4. **Statement of Standard Verification:** This statement documents the concentrations of TFM in subsamples of field standard used during the treatment season. The concentrations of TFM in the subsamples are measured at the end of the treatment season, and results are reported in this document.
5. **Field Standard Use Log:** This log is used to record the disposition of all samples of field standard. The log contains copies of all documents pertaining to the standards. All samples of field standard accepted at the facility are identified by code number on the form. The disposition of each sample is tracked by entering when the sample is transferred and the new storage/use location. History of the sample is closed when the date of depletion sampling is recorded.

F. Management of Lampricide Records

Data and records of procedures conducted to assure the quality of lampricide stocks and standards are preserved under procedures outlined in AOP:013.x.

III. Standards

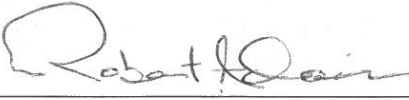
The integrity of analytical standards is a particular concern. The efficacy of lampricide applications depends directly on the accuracy of the analytical standards used in lampricide analyses. The procedures used to insure the accuracy of all analytical standards used in sea lamprey control are detailed in TOP:019.x. These procedures cover all aspects of the preparation and use of analytical standards. The procedures are involved; flow charts describing the procedures are attached (attachments 1 and 2).

IV. Operating Procedures

The Standard Operating Procedures (SOPs) which describe methods and techniques followed in sea lamprey control operations are classified into three types: Administrative Operating Procedures (AOPs), Technical Operating Procedures (TOPs), and Instrument Operating Procedures (IOPs). Each AOP describes an administrative or support function in the sea lamprey control program. TOPs detail the methods for conducting lampricide control activities. Data collection and lampricide application methods are described in TOPs. IOPs provide detailed instruction in the calibration, use, and maintenance of instruments used while conducting a TOP. IOPs generally are cited in TOPs.

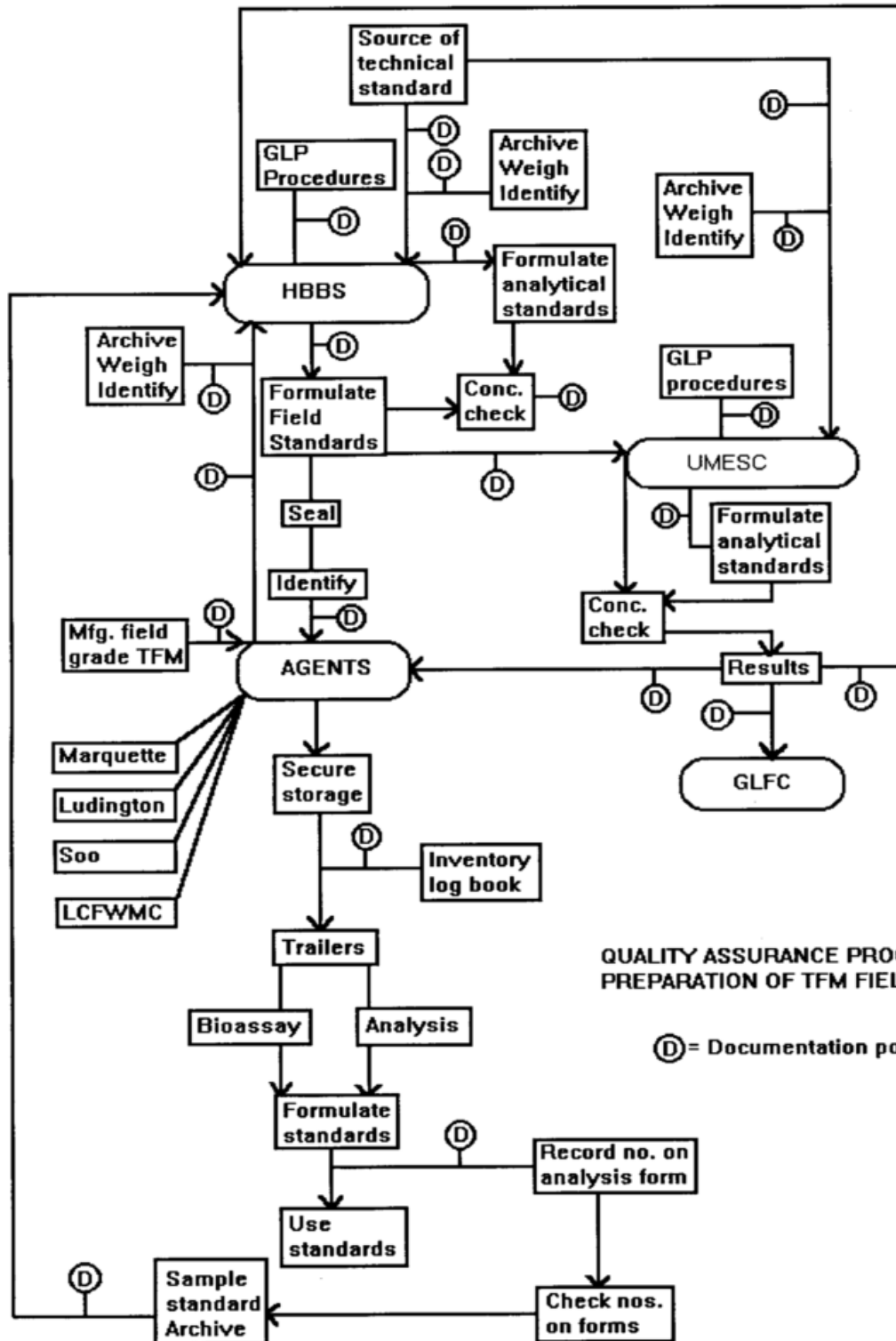
A listing of the procedures follows the narrative section of this manual. This list and the content of each SOP is updated according to AOP:002.x to assure that all methods are current.

This procedure has been reviewed and approved by the undersigned representatives of the U.S. Fish and Wildlife Service and Fisheries and Oceans Canada.

REVIEWED/APPROVED  DATE 2-12-14
Field Supervisor (U.S.)

REVIEWED/APPROVED  DATE 2-12-14
Division Manager (Canada)

ATTACHMENT 1 Quality Assurance Procedures Used in the Preparation of TFM Field Standards



ATTACHMENT 2

Quality Assurance Procedures Used in the Preparation of Bayluscide Field Standards

