TOP:012.5

March 13, 2015

U.S. Fish and Wildlife Service
Marquette Biological Station
3090 Wright Street
Marquette, Michigan 49855
U.S.A.

and

U.S. Fish and Wildlife Service
Ludington Biological Station
229 South Jebavy Drive
Ludington, Michigan 49431
U.S.A.

and

Department of Fisheries and Oceans
Sea Lamprey Control Centre
1219 Queen Street East
Sault Ste. Marie, Ontario P6A 2E5
Canada

TECHNICAL OPERATING PROCEDURE

PROCEDURE TITLE:

Procedures for the Application of TFM

APPLICABILITY:

Procedures apply to all applications of TFM to flowing waters

PRINCIPLE:

Standard procedures for the application of TFM (EPA Registration Number 6704-45; Health Canada Pest Control Products Number 21124 and 11763) to streams.

SAMPLE COLLECTION AND PRESERVATION:

Not applicable

EQUIPMENT REQUIRED:

I. Low volume (20 - 600 L) applications

A. Standard applications are conducted with a 12-volt peristaltic pump (IOP:005.x). The apparatus consists of a drive unit and selection of pump heads. Each pump is stored in a pump box, which contains size 14, 16, and 18 heads or a quick-load head, 18 inch silicone head tubes specific for particular sized heads, several 6 to 8 foot lengths of 3/8 and 1/4 inch inside diameter plastic tubing, and accessories. Normally, two pumps are taken to an application site with at least two 12-volt, deep cycle, and rechargeable batteries for a 12-hour application.

B. Each application kit includes the following:

Graduated cylinders	Emergency eye wash
Chemical splash goggles	Soap
Rubber apron	Spill emergency plan (MSDS)
Vice grip pliers	Pliers/large adjustable tool
Screwdrivers	Face shield
Flagging tape	Stopwatch
Rubber gloves	

C. Other tools and equipment available for an application includes:

Trouble lights	Chemical spill kit
Warning signs	Drop/ground cloth
Insect repellant	Flashlight
Respirator	Large plastic tub with screen
Garbage bags	Shovel
Hand held 2-way radio	Bucket
Spreader apparatus	Rope
Raincoat	Spill containment equipment
GPS Unit/Compass	

II. High volume (>600 L) applications

A. Large scale applications are conducted with large, 120-volt AC, peristaltic (IOP:005.x) and centrifugal pumps (IOP:005.xA). If line power is not available a 120-volt generator is used to provide power for the pumps and lighting. The same basic equipment for the standard application is required to complete the application. Devices for measuring application rates include in-line meters, built-in graduated cylinders, and electronic metering devices. Lampricide is pumped from large vats through the metering devices to the application site. Additional equipment includes a container washing device and associated items such as hoses which are used to rinse empty TFM containers.

B. Spreader systems are used to apply lampricide evenly across a stream. A perforated hose or plastic tube is placed across the stream. The metered lampricide is fed into a sump where it mixes with stream water. A second pump is used to move the diluted lampricide through the perforated hose. TFM and Bayluscide are fed independently into the sump and pumped across the stream. Spreaders of various types are used for both large and small applications.

III. Non-mechanical application equipment

Small applications of less than 40 L TFM are made with two types of air tight containers which gravity feed the TFM. Pour-portioners are light weight devices that screw onto TFM containers. Constant-head feeders are sealed containers that hold and deliver TFM. The devices allow air pressure to equalize within the containers as the lampricide is fed. A stopwatch and graduated cylinder are required to measure application rates.

POTENTIAL INTERFERENCES:

None

SAFETY:

Environmental Hazards

State, local, and provincial fish and game agencies must be contacted before product is applied. Municipalities that use streams requiring treatment as potable water must be notified of the impending treatment at least 24 hours prior to application. Agricultural irrigators that use streams requiring treatment as a source of irrigation water must be notified of the impending treatment at least 24 hours prior to application. Agricultural irrigators must turn off their irrigation system for a 24-hour period during and after treatment.

Personal Safety

TFM is a restricted use pesticide. Refer to the pesticide label (Appendix E) and SDS (Appendix F) for specific personal safety instructions.

DISPOSAL:

Lampricide spray mixture or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides. Triple rinse empty containers and offer container for recycling, reconditioning, or disposal in approved landfill. Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

REAGENTS:

Not applicable

PROCEDURES:

I. Scheduling

The treatment supervisor posts a daily work schedule. The schedule details location of application, time of application, approximate application rates, and equipment and estimated quantity of lampricide required. The work schedules for applicators vary. The schedule allows time for an applicator to travel to and from a work site.

An application generally requires two shifts of applicators. The first applicator travels to the site and prepares for the application. The second applicator normally contacts the first on the two-way radio prior to leaving the base camp, to check on status of lampricide and equipment. The second applicator arrives early enough to receive instructions from the first applicator. The second applicator completes the application and is responsible for disassembling and cleaning the application equipment, cleaning the site, and returning the equipment to the base camp.

II. Preparations for application

Properly locating an application site is a critical consideration. The treatment supervisor selects the general location and records it on the schedule and on a treatment map. The applicator records site information and acquires maps of sufficient detail to locate the site. In most cases, the applicator has previously inspected the site. The exact site is selected by the applicator after considering requests from analysis personnel. The choice of the site is important. The site must be readily accessible, be safe to work from, and provide for rapid mixing of lampricide.

After the necessary equipment is transported to the site, the application site is secured. Radio communications are established and traffic warning devices may be deployed. The applicator reports to the analysis person and relays information such as staff gauge measurements.

Personnel handling lampricides are required to wear personal protective equipment as specified in the pesticide label and SDS (Appendices E and F) which includes steel-toed rubber boots, an apron, rubber gloves, and face splash shield. The applicator prepares the metering device (IOP:005.x and IOP:005.xA). TFM is pumped directly from the original container for low volume applications. Constant-head devices are filled on site. On larger applications, TFM is poured into a plastic tub with a volume of 120 liters or greater. TFM is applied through a spreader system or is metered into an area of the stream which optimizes mixing. Lampricide must mix quickly to allow analysis and subsequent adjustment of the application rate (TOP:018.x).

III. Application

Precise procedures are followed during the application of lampricides. The applicator contacts the person in charge of analysis and receives the initial application rate and starting time. The metering device is then started and the applicator checks the system for proper operation. Applicators measure the application rate with a stop watch and graduated cylinder. For accuracy, the smallest graduated cylinder is used which can conveniently measure the volume of TFM dispensed in a designated length of time. The feed rate is checked initially for 30 seconds to approximate the desired feed rate; to accurately measure the feed rate the delivery is checked for one minute. After the application is initiated, the applicator normally measures and records the feed rate at 30 minute intervals or as requested by analysis personnel. When the application rate does not match the desired rate, the output is adjusted. If the desired feed rate cannot be achieved with pump in use, the pump and/or head are changed.

The delivery rate is maintained as close as possible to the desired application rate. Physical factors which cause the application rate to drift include changing depth of the TFM in the tub, changing temperature, and decreasing 12-volt battery output. Applicators monitor these factors to insure that the application proceeds as planned. All applications are monitored throughout the length of application. No application equipment or lampricide is left unattended during an application.

Information is recorded on the Feeder Data Sheet (Appendix M) after each check of the application rate. The recorded information includes the 24-hour time, measured application rate, adjusted application rate, amount of lampricide added, and other pertinent information such as the staff gauge reading.

IV. Cleanup

Empty TFM containers are triple rinsed at the application site. If the washing of containers is not possible, the empty containers are sealed, labeled, and stored for rinsing on a future treatment. Containers are rinsed only with the permission of the analysis person and normally are not rinsed on small streams where the operation would significantly affect TFM concentration. Containers must be triple-rinsed or power-rinsed equivalently. The container bungs are washed and placed in plastic bags for disposal.

At the end of the application, lampricide remaining in the tub is pumped back into the original container. The pumps are operated with stream water to remove lampricide from the hoses. The pumps then are shut off, disassembled, and cleaned, and the hoses and tub rinsed. All equipment used on the site is cleaned and packed into appropriate containers. All lampricide containers are checked for cleanliness and returned to the truck. Upon return to the control base of operations, the lampricide and empty containers are secured in a locked truck or trailer. All metering devices and application kits are returned to storage. The 12-volt batteries are recharged.

Spilled lampricide is cleaned up immediately. A large spill is reported immediately to the treatment supervisor and disposed of according to the Contingency Plan for Countering Spills of TFM and Bayluscide in Canada and the United States (Appendix D).

V. Public relations and public safety

The applicator remains at the application site to insure that the site is not disturbed; the public is kept a safe distance from the concentrated lampricide. Warning signs (Appendix O) or caution ribbons are posted to prevent the public from approaching the application equipment. Information and informational brochures are available to the public from the applicator onsite or the treatment supervisor.

VI. Recording application data

At the base of operations, the Feeder Data Sheet (Appendix M) is inspected for accuracy. The data from the form is entered into the data base (TOP:024.x). Data entered includes location of the application site including stream name and geographical description, date and time of application, length of application, description of the lampricide applied, quantity of lampricide applied, and identity of the applicators. The form is then submitted for filing.

REFERENCES:

Sea Lamprey Larvicide -Restricted Use Pesticide label
Safety Data Sheet
Pesticide Spill Plan

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 3-24-15
Field Supervisor (U.S.)

REVIEWED/APPROVED _____ DATE March 25/2015
Division Manager (Canada)