

Interim Whirling Disease Decontamination Protocol V3.0

Monitoring Section

Alberta Environment and Parks - Environmental Monitoring and Science Division

Scope and Purpose

These decontamination procedures aim to prevent AEP monitoring staff from spreading Whirling Disease throughout the Bow River basin, as well as into any other basins, while undertaking their day-to-day duties. These proposed procedures will be adopted by all members of staff that are working on surface water in the Bow River basin, whether in the main stem, or any of the tributaries connected to the Bow River. This protocol is meant to be expanded to other watersheds as information becomes available. The proposed measures would maintain the feasibility of the established surface water quality (SWQ) and hydrometric monitoring programs while still allowing for integration of many safety measures outlined by the Interim Guidelines for the Disinfection of Fisheries Equipment to Reduce the Spread of Whirling Disease (Version 1.3). The current monitoring protocols have been reviewed by representatives from DFO, CFIA, and ASERT to ensure their effectiveness.

This protocol is intended to be a living document, and will evolve as more information becomes available. Any revisions to these protocols will be implemented immediately upon approval, and continue them until such a time as the risk of spreading whirling disease is no longer deemed a substantial threat. Monitoring will continue to work closely with the Whirling Disease

Designation of Sample Areas

Within the Bow basin, all SWQ sites have been categorized into distinct “reaches” (Table 1). These reaches are grouped based upon several criteria or specific rationale. Typically, a single reach is defined as a site or collection of sites that are separated by less than 30km, and have no barriers to fish movement (manmade or otherwise). Some sites in the SWQ program are located in ephemeral streams, or irrigation returns and they have been considered on a case by case basis (Table 1). There is only one Water Survey Canada co-managed hydrometric station located on the Highwood River, and staff will treat this location as a separate reach (Table 1). The same principles may be used when defining reaches in other watersheds.

All sites that fall within a single reach can be sampled following normal standard operating procedures, without the need to decontaminate equipment and gear between them. When staff members move between reaches a field decontamination will be performed. Staff members that are travelling between contaminated and uncontaminated basins will also utilise separate sets of PPE in addition to the outlined disinfection protocols to avoid spreading the disease.

Sample Equipment

Wherever possible, staff will aim to reduce the amount of field gear and sampling equipment that comes into contact with water or wet organic material at sampling sites. Disposable coverings can be used where possible to eliminate the amount of time spent on disinfection procedures. This includes the use of disposable plastic coverings over top of sampling gloves, plastic liners in coolers that will contain water samples, or disposable bags in place of padded equipment cases (Table 2). As ice packs are used for sample preservation, they will be contained within disposable plastic bags to prevent contact with contaminated water.

Staff sampling in multiple basins will have a separate set of PPE for basins with and without whirling disease present, so as not to carry water or organic material from a contaminated source to any other water body (Table 3). Staff will purchase a second set of wettable PPE labelled “WD” that are to be

used only in the basins with confirmed cases of whirling disease, in addition to the field and daily decontamination procedures. This “WD” equipment will not be taken into any other uncontaminated river basin, even after field and daily decontamination.

Gear made of leather, felt, wood, Styrofoam, Velcro, or rope will not be used in open water conditions as outlined by the Interim Guidelines for the Disinfection of Fisheries Equipment to Reduce the Spread of Whirling Disease (Version 1.3) because of the difficulty in achieving a complete decontamination. Cases with porous padding will only be used for the storage of fully decontaminated equipment.

All disinfection will be performed using Quaternary Ammonium Compound (QAC) sprays and baths that have been diluted as follows to 1500ppm of active ingredient:

Quat Plus M5 (7.7% QAC concentration)

$$7.7\% * 10,000 = 77,000ppm$$

$$\frac{77,000ppm}{1500ppm} = 51.3$$

1L Quat Plus : 50.3L water

The use of QAC solution at 1500ppm in both spray bottles and baths paired with clean water rinses will be the primary method of field and daily decontamination procedures.

Employees handling both concentrated and 1500ppm QAC dilutions should be wearing safety goggles and nitrile gloves. Some staff may also find the use of respiratory masks to be beneficial. Eyewash stations and WHMIS labels have been added to the office locations where QAC is stored, and diluted solution is used.

Field Decontamination

On-site field decontamination procedures will be implemented when staff travel between the defined reaches of the Bow (Table 1), or another affected watershed. Each truck will be outfitted with a disinfection kit for on-site decontamination (Table 2). Field decontamination procedures will proceed as follows:

1. Upon completion of sampling at a **site**:
 - a. place any samples collected inside a plastic garbage bag, and tightly seal the opening before moving samples to the truck/another cooler
 - b. Dispose of any used disposable bags, gloves, and cooler coverings in a bio secure container, to segregate contaminated items for appropriate final disposal
2. Upon completion of sampling within a **reach**:
 - a. Follow previous steps for completion of sampling at a site
 - b. Stand within a shallow rubber tote, or remove PPE and place in rubber tote if possible, and use clean water and scrub brushes to remove ALL organic debris from boots, waders, sampling gloves, or other PPE that made contact with flowing water
 - c. Thoroughly spray down boots, waders, sampling gloves or other PPE with QAC solution at 1500pm
 - d. Place cleaned and sprayed PPE within a dry bag and seal
 - e. Dispose of rinse water into the environment, away from the waterbody

- f. Repeat for second staff member if necessary
- g. Use clean water and scrub brushes to remove organic debris from multiprobes, cables, taglines, wading rods, survey equipment, coolers, or other equipment taken into the water
- h. Use QAC spray to coat all rinsed equipment (cables, coolers, and sonde casing etc.)
 - Sonde probes and calibration cups can withstand QAC detergent without the need for re-calibration and will be carefully sprayed, and the calibration cup replaced to allow for 10 minutes of exposure
 - Teflon coated sensors in the M9, Flowtracker, StreamPro, and ADCP are able to receive QAC spray treatment
- i. Equipment will be allowed to sit with QAC spray for 10 minutes without contact with any other equipment and surfaces (this can be done while travelling to another reach)
- j. Upon arrival at a new reach, remove boots/waders and other equipment from the dry bag and thoroughly spray down the interior of the bag with QAC solution to prevent the bag itself from becoming a disease vector
- k. Replace any disposable cooler coverings, bags and gloves

Daily Decontamination

And the end of each day, a more thorough decontamination protocol will be undergone at the equipment storage space in Calgary. A decontamination “bay” has been established as close as possible to the outside doors used by field crews. This bay consists of a large tub of QAC solution, a sink for clean water rinses, and lipped floor mats to prevent spilled liquids from spreading and coming into contact with other equipment. Equipment that has received QAC treatment will be segregated to a separate area for drying, and will not be stored with other gear in staff’s personal lockers. Daily decontamination procedures will proceed as follows:

- a. Waders, boots, or any other wettable and submersible materials that came into contact with Bow River water will be placed in a tub containing 100L of 1500ppm QAC solution and allowed to soak for 10 minutes
- b. Dry bags used for storing field equipment, and the scrub brushes used in cleaning organic debris will be submerged in QAC bath for 10 minutes
- c. Cables, multiprobe casings, and the outside of coolers used in the Bow River will be coated in QAC solution and allowed to sit wet for 10 minutes
 - EXO Sonde probes and calibration cup can be submerged in the QAC bath for the full 10 minutes
 - Teflon coated sensors in M9, Flowtracker, StreamPro, and ADCP equipment are able to receive a secondary QAC spray treatment
- d. EXO multiprobes, and neoprene waders and boots that can be impregnated with detergent should be rinsed with clean water following QAC treatment.
- e. All equipment will hung to dry in the designated drying room and will not be taken out in the field again until completely dry (24 hour drying time is recommended)
- f. Disposable gloves and bags will be collected in a large bio secure container for proper final disposal (likely incineration). Disposable bags on ice packs will be removed, and disposed of in bio-secure bins as well
 - Biosecure bins will all have all waste double bagged, duct taped closed, and dated when full

- When bio secure containers are emptied they will receive a QAC spray and be allowed to sit for 10 minutes

The 1500ppm QAC solution will not be disposed of into the Calgary sewer system, and will instead require a specialized method of disposal. Discussions with the City of Calgary are ongoing about whether or not QAC can be delivered to the waste water treatment plant.

The 1500ppm bath of QAC will require the addition of both clean water and QAC Plus M5 to maintain the necessary concentration of active ingredient. QAC Check 1500 test strips are located in the decontamination bay, and will be used to ensure the QAC bath maintains an effective concentration.

Disposable gloves and bags stored in the bio secure bin may require specialised disposal procedures, likely incineration.

Sample Analysis

All laboratories used for the analysis of water samples from the Bow River (Maxxam Analytics, Alberta Innovates Technology Futures, the University of Alberta, and Provincial Lab) will be notified of the potentially hazardous nature of samples coming from the Bow River and its tributaries. Samples from the Bow basin will indicate “alternate disposal required.” It is recommended that labs use a procedure akin to the one implemented for water samples coming from lakes that are monitored for zebra mussels. Several options for disposal are currently being considered including acidification, autoclaving, or inclusion with other hazardous waste.

The parameters analysed by each lab will remain constant, and no additional sample locations or parameters will be added to existing projects. A series of blanks will be done at sites in the Bow basin that use decontamination procedures to ensure that the presence of QAC does not impact sample integrity. Collection of epilithic algae at the sample sites of the Bow River main stem will halt immediately, as the amount of surface area coming into contact with water and organic material would be difficult and time consuming to effectively decontaminate.

Seasonal Considerations

Once ice forms on the Bow, decontamination procedures will expand to include field and daily decontamination of equipment such as ice augers, ice picks, cleats and any other additional PPE required for winter sampling that come into contact with flowing water. Procedures may be revised, as sampling in winter conditions may avoid contact of water with boots, cleats, or waders, so they may not require the same decontamination as they would in open water conditions.

Winter PPE for on-ice safety and rescue (ie: life jacket, throw bags, ropes, ice screws, belts, and carabiners) will be kept out of the water except when used for an ice rescue incident. Therefore, these items will only require decontamination if they come into contact with water from the channel.

Field decontamination will become increasingly difficult at low temperatures due to potential freezing of organic debris, clean water rinses, and QAC solutions. Additionally, damp field equipment and PPE in freezing temperatures may present a safety issue for staff. In these cases, field decontamination may not be a viable option, and teams may need to return to the decontamination bay in Calgary after completing a single reach. This has the potential to add a substantial amount of man-hours to a project. It is not recommended that alternate locations (ie: other regional offices or warehouses) be used unless they have proper segregation and containment of equipment.

Boat sampling procedures will be revised and sent out for review at the beginning of the sampling season in May 2017.

Implementation and Training

The decontamination protocols are to be adopted immediately upon approval, and utilised in all basins that have had the presence of whirling disease confirmed within them. At the time of writing, the Bow River basin is the area of most concern. Should these contaminated areas spread to other basins, the limnologists and field technologists responsible for these regions will collaborate to create defined reaches using the criteria outlined in the Bow River basin (Table 1). It is also possible, that decontamination bays will need to be established in Lethbridge, Edmonton, and Grand Prairie as more information becomes available. Furthermore, each region will need to collaborate with their respective municipalities to receive instruction of the proper disposal of QAC solution.

This document will be distributed to all monitoring staff so that they may familiarize themselves with the proper steps of decontamination, as well as locations where it is required. All monitoring staff that are working in basins with whirling disease will adhere to these protocols, and are required to purchase the necessary equipment to ensure they are followed correctly (Table 2,3). Calgary monitoring staff have collaborated to train with this procedure, and will work with their respective larger working groups to demonstrate or clarify any protocols to other regional offices if other basins become effected.

Table 1. The division of all SWQ and hydrometric sites of the Bow River and its tributaries into reaches for the purpose of establishing areas between which decontamination procedures are necessary.

Reach	Sites Included	Station Code	Rational
1	Waiparous Creek near the Mouth Ghost River u/s Waiparous Creek confluence	AB05BG0100 AB05BG0090	Sites are within 30km of each other; no natural obstructions to fish movement
2	Jumpingpound Creek u/s of mouth Bow River At Cochrane	AB05BH0040 AB05BH0010	Sites are within 30km of each other; no natural obstructions to fish movement
3	Elbow River at 9 th Ave Bridge	AB05BJ0450	Confirmed area of contamination
4	Nose Creek near the Mouth Fish Creek near the Mouth Pine Creek near the Mouth	AB05BH0370 AB05BK0070 AB05BM0145	Sites are within 30km of each other; no natural obstructions to fish movement
5	Highwood River near mouth Highwood River d/s of High River	AB05BH0490 AB05BL0210	Sites are within 30km of each other, and within the same river system; no natural obstructions to fish movement
6	Sheep River near mouth d/s Okotoks at Hwy 2 Sheep River near Black Diamond	AB05BL0470 AB05BL1440	Sites are within 30km of each other and within the same river system; no natural obstructions to fish movement
7	Bow River Below Carseland Dam	AB05BM0010	N/A
8	West Arrowwood Creek East Arrowwood Creek	AB05BM0575 AB05BM0585	Sites are within 30km of each other; ephemeral streams with low flow, with low probability of bearing cold water fish
9	Crowfoot Creek near Cluny Bow River At Cluny	AB05BM0620 AB05BM0590	Sites are within 30km of each other; no natural obstructions to fish movement
10	12 Mile Creek near the mouth New West Coulee Coal Creek near mouth	AB05AJ0060 AB05BN0130 AB05BN0070	Sites are within 30km of each other; streams are irrigation returns carrying water originally from the Bow and returning it to the main stem; no natural obstructions to fish movement
11	Bow River Near Ronalane Bridge	AB05BN0010	N/A
12	South Saskatchewan River Above Medicine Hat Ross Creek Seven Persons Creek South Saskatchewan River Below Medicine Hat	AB05AK0020 AB05AH0020 AB05AH0050 AB05AK0990	Sites are within 30km of each other; no natural obstructions to fish movement
13	Highwood River below Little Bow Canal	05BL004	N/A

Table 2. Tools required for on-site decontamination kits for sampling equipment within the Bow River and its tributaries. This list is intended to outfit 5 vehicles with complete decontamination kits. Additional items would be required for more teams.

Equipment	Additional # Required	Estimated Cost Per Item (\$)	Total Estimated Cost (\$)
Rubber Totes	10	10	100
Scrub Brushes (plastic)	10	10	100
Respiratory Masks	0	-	-
Protective Goggles	10	20	200
55L Dry Bags	10	45	450
Bio Secure Refuse Containers	5	20	100
Jugs of Clean Rinse Water	0	-	-
Spray Bottles	5	5	25
Box Long Disposable Gloves	5	20	100
Box Disposable Bags for Coolers	5	10	50
Estimated Total			1,125

Table 3. Additional equipment needed for containment of whirling disease and daily decontaminations. This list is intended to outfit 6 staff. Additional items may be required. The prices of waders, boots, and cleats are based on allowances outlined by the Government of Alberta.

Equipment	Additional # Required	Estimated Cost Per Item (\$)	Total Estimated Cost (\$)
Chest waders dedicated to Bow basin	6	230	1380
Steel toed rubber boots dedicated to Bow basin	6	80	480
Winter boots dedicated to Bow basin	6	250	1500
Ice cleats dedicated to Bow basin	6	100	600
Quat Plus M5 (2L)	17	50	850
Quat Check 1500 Test Strips	5	15	75
Bio Secure Refuse Bin	1	200	200
200L tub for QAC Soak	0	-	-
Estimated Total			5,085

References:

Interim Alberta Whirling Disease Decontamination Guidelines, Ver. 1.3, Sept. 14, 2016. Alberta Environment and Parks