Geotextile Benthic Barrier Installation Guide
1.0 General

1) This guideline covers general installation of a 12 x 12 foot wooden frame benthic barrier to inhibit the growth of invasive aquatic plants.
   a) It can be difficult to sink a wooden frame.
      (1) Alternate methods exist.
2) Where contradictions occur follow the instructions of the project engineer.
3) Geotextiles float!
   1) Needle-punched nonwoven geotextiles are made from 100% polypropylene.
      a) Polypropylene has a density of 0.91.
         i) As such, geotextiles will float in water and require a ballast.

2.0 Alternate Methods for Placement

1) A 1 inch diameter PVC pipe frame filled with sand for ballast.
2) A rebar frame, if permitted.
3) Geotextile panels weighted with rebar pieces and covered in rock.
   a) Lay panel on level ground and attach sacrificial ballast.
      i) Typically scrap ¾ inch rebar pieces attached along geotextile length at 6 foot centers.
         (1) Cable ties, wire or tape are attachment options.
         (2) Holes are made in fabric with a push rod or utility knife.
            ii) Folds, pockets or straps can be field sewn in the fabric for weights or sinking poles.
   b) Float the prefabricated panel into position.
   c) Ballast it into place by dropping native cobbles onto it from a boat.

3.0 Equipment & Materials for Wooden Frame

1) Five 12 foot long 2 x 2’s
2) 2 inch long galvanized screws
3) ¼ inch plywood
   a) Approx. 4 square feet per frame will be required to cut 12 triangular gussets.
4) 6 oz/sq yd nonwoven needle-punched geotextile fabric
   a) US 160NW is recommended.
      i) 1 roll is 12.5’ x 360’
5) Staples
6) Six to ten woven, 14 x 6 inch polypropylene sandbags with ties
7) Boat
8) Hammer
9) Saw
10) Utility knife
11) Heavy duty staple gun
4.0 Building Wooden Frame

1) Lay the 2 x 2’s to create a frame with four sides and a center brace.
2) Cut triangular gussets from the plywood.
   a) Each side of triangle will be 5 inches long.
3) Secure gussets with screws at each joint of the frame.
4) Turn the frame over and lay the precut piece of geotextile over the frame.
   a) Geotextile can be cut with a utility knife.
5) Staple geotextile to the frame and trim any excess.
6) Screw additional gussets on top of the fabric at each joint of the frame.
7) Partially insert screws into frame at each corner to use as attachments for the weighted sandbags.
8) Cut 1 to 2 inch angular slits along the length of the fabric to allow bubbles to escape.
   a) The key is to make as many cuts as possible without diminishing the light blocking ability of the geotextile.
   i) Every 3 feet in both directions is suggested.
9) Fill sand bags with native lake cobbles and close with tie.
   a) If native cobbles are not available use clean rocks.
   b) Do not use sand.

5.0 Place Barrier

1) This will require someone to be in the water.
   a) In shallow water a wet suite and snorkel may work.
   b) In deep water a scuba diver maybe required.
2) Remove any sticks or large stones from the lake bottom.
   a) Pay particular attention to where the frame will rest.
3) Slide the frame into the water.
   a) The frame will float.
4) Once in position, attach weighted sandbags to the corners of the frame.
   a) Use the ties to attach them to the protruding screws.
   b) If water is less than 12 feet in depth, allow one side of the frame to touch the bottom before attaching bags to the other side.
   c) In deeper water attach bags to all four corners at once.
5) Have the diver place additional weighted bags over the center brace of the submerged frame.
6) If multiple frames are being installed:
   a) Make sure there are no gaps between the frames.
   b) Place additional weighted sandbags over the area where the frames meet.
7) Collect any plant fragments that are created as a result of installation.
6.0 Mark as a Hazard

1) If barrier is in less than 6 feet of water mark the area with buoys to warn swimmers and boaters.
2) If barrier is in an area where boaters may anchor, post a warning sign.

7.0 Repair & Maintenance

1) Monitor the frame to make sure it is staying in place and air bubbles are not forming.
   a) This probably needs to be performed 1 to 2 times per month.
   b) If air bubbles are an issue the frame will need to be partially lifted to “burp” it or cut additional slits in the fabric to release air bubbles.
   c) If geotextile is placed without a frame:
      i) Overlap damaged area a minimum of 3 feet in all directions and fully cover with stone.

8.0 Overlapping Geotextile (No Frame Used)

1) Panel overlap widths are site specific and generally at the discretion of the site engineer.
   a) A minimum overlap of 3 feet is recommended for under water geotextile placement.
2) Overlaps are required to ensure that all of the underlying soils are fully covered.
   a) Keep in mind the geotextile can move during placement of the rock.
3) Marking the ends of the geotextile.
   a) Spraying white lines on the fabric where the overlap occurs may be useful in some waters.
      i) For example, 3 feet in from the edge of the panels.

9.0 Storage

1) Geotextile rolls are wrapped in a UV protective cover.
2) If stored outdoors for a prolonged period, the geotextile should be elevated from the ground and covered with a tarpaulin or opaque plastic.
   a) Contractor should insure rolls are adequately protected from:
      i) Moisture
      ii) Ultraviolet radiation
      iii) Chemicals that are strong acids or bases
      iv) Temperatures in excess of 140°F
      v) Animal destruction

This material is presented for general information only. Always verify the suitability for a specific application with the project engineer. Where contradictions occur, follow the instructions of the project engineer. There is no implied or expressed warranty regarding the installation procedures or the geosynthetic products in this guide. Installation procedure and product choice is the sole responsibility of the contractor and contractor assumes all liability.