Best Management Practices
For Pile Removal & Disposal

March 1, 2007

The purpose of the following Best Management Practices (BMPs) is to control turbidity and sediments re-entering the water column during pile removal, and prescribe debris capture and disposal of removed piles and debris.

BMP 1. Pile removal

A. Vibratory extraction is the preferred method of pile removal.

1) Crane operator shall be trained to remove pile slowly. This will minimize turbidity in the water column as well as sediment disturbance.

2) Operator to "Wake up" pile to break up bond with sediment.
   - Vibrate to break the skin friction bond between pile and soil.
   - Bond breaking avoids pulling out a large block of soil – possibly breaking off the pile in the process.
   - Usually there is little or no sediment attached to the skin of the pile during withdrawal. In some cases material may be attached to the pile tip, in line with the pile.

3) A major creosote release to the environment may occur if equipment (bucket, steel cable, vibratory hammer) pinches the creosoted piling below the water line. Therefore, the extraction equipment must be kept out of the water.

4) Piling must not be broken off intentionally by twisting, bending or other deformation. This practice has the potential for releasing creosote to the water column.

5) Work surface on barge deck or pier shall include a containment basin for pile and any sediment removed during pulling.

6) Basin may be constructed of durable plastic sheeting with sidewalls supported by hay bales or support structure to contain all sediment. Water run off can return to the waterway.

7) Work surface shall be cleaned by disposing of sediment or other residues along with cut-off piling as described in BMP 2C below.

8) Containment basin shall be removed and disposed in accordance with BMP 2C below or in another manner complying with applicable federal and state regulations.

9) Upon removal from substrate the pile shall be moved expeditiously from the water into the containment basin. The pile shall not be shaken, hosed-off, stripped or scraped off, left hanging to drip or any other action intended to clean or remove adhering material from the pile.

B. Cutting will be necessary if the pile has broken off at or near the existing substrate so that it cannot be removed without excavation, or below the water line. Pile cutoff is an acceptable alternative if vibratory extraction or pulling is not feasible. Every attempt should be made, however, to completely remove the piling in its entirety before cutting. If a pile is broken or breaks above the mudline during vibratory extraction, one of the methods listed below should be used to cut the pile. Prior to commencement of the work the project engineer or contractor should assess the condition of the pilings. Contractor or project engineers need to create a log outlining the location and number of pilings that need to be cut and have this log available to the agencies upon request.

1) A chain should be used, if practical, to attempt to entirely remove the broken pile.

2) If the entire pile cannot be removed, the pile should be cut at or below the mudline by using a pneumatic underwater chainsaw. Project-specific requirements for cutoff should be set by the project engineer considering the mudline elevation and the presence of contaminants in the sediment. Generally, piling should be cut off at the mudline if sediments are contaminated and the mudline is subtidal, to minimize disturbance of the sediment. Piling should be cut off at least 1 foot below the mudline in intertidal areas where the work can be accomplished in the dry. Piling should be cut off at least 1 foot below the mudline in subtidal areas where the sediments are not contaminated. Repeated attempts to remove pile with a clamshell bucket (i.e., “grubbing”) should not occur in contaminated sediments, or below the water line.

3) Piles shall be cut off at lowest practical tide condition and at slack water. This is intended to reduce turbidity due to reduced flow and short water column through which pile must be withdrawn.

4) If the piling is broken off below mudline greater than 1 foot, the piling may remain, provided it is located in deep subtidal waters. In intertidal and shallow subtidal areas, seasonal raising and lowering of the beach could expose the pilings above the mudline and leach out PAHs or other contaminants. In this case, the piling should be cut off at least two feet below the mudline if it is accidentally broken off during removal.

5) Depending on future use, the removal contractor should provide the location of the broken pile using GPS. This will be necessary as part of debris characterization should future dredging be a possibility in the area of piling removal.

BMP 2. Disposal of piling, sediment and construction residue

A. Pulled pile shall be placed in a containment basin to capture any adhering sediment. This should be done immediately after the pile is initially removed from the water.

1) Utilize basin set up on the barge deck or adjacent pier

2) Basin may be made of hay bales and durable plastic sheeting.

B. Piling shall be cut into 4' lengths with standard chainsaw.

C. Cut-up piling, sediments, construction residue and plastic sheeting from the containment basin shall be packed into a container. For disposal, ship to Rabanco/Seattle, Weyco facility at Longview Washington, or to another facility complying with federal and state regulations.

BMP 3. Pile replacement

A. Pile material

1) EPA prefers concrete piles for large structural replacements. Pilings made up of painted steel, unpainted steel, steel coated with epoxy-petroleum compound or plastic are also acceptable. Should untreated wood be used for fender piles then rub strips are recommended on the face of the wood.

2) ACZA treated timber piles may be used that comply with the Amendment to the Best Management Practices for the Use of Treated Wood in Aquatic Environments; USA Version – Revised April 17, 2002. Western Wood Preservers Institute. Rub strips are recommended if ACZA treated wood is to be used for fender piles. Coordination with WDFW is also recommended regarding metal leachability into the aquatic environment. When using ACZA, it is recommended that it be demonstrated that copper and arsenic levels in surrounding sediments be within the state SQS.

B. Vibratory hammer shall be used to drive piles. Work may be done from floating or land based construction equipment.

BMP 4. Debris capture in water

A. Floating surface boom shall be installed to capture floating surface debris. Debris is to be collected and disposed of along with cut-off piling as described in BMP 2C above.

BMP 5. Resuspension/Turbidity

A. Crane operator shall be trained to remove pile from sediment slowly.

B. Work shall be done in low water and low current.

C. Removed piles shall be placed in a containment facility.

D. Sediments spilled on work surfaces shall be contained and disposed of with the pile debris at permitted upland disposal site.