Screening Level Assessment Process and Worksheets

For

Endangered Species Act and Essential Fish Habitat Consultation on Proposed Applications of Treated Wood in Aquatic Environments

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Purpose

This document is a follow-up to the October 2009 NOAA Fisheries Guidelines on "The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions."[1]

It is intended to be a supplemental tool to support consistent, objective decisions in assessing the potential effects of proposed applications of treated wood in aquatic environments. And it has been designed for use by National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) staff, federal action agencies and project applicants in consultations under Section 7 of the Endangered Species Act (ESA) and Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Using a screening level assessment process and completing the screening worksheets developed for the assessment, both regulators and project proponents can determine whether a proposed project meets the screening criteria to allow it to advance, or require additional risk assessment before it can move forward.

The Assessment Worksheets were developed using recent NOAA Guidelines[1] for treated wood products and the Western Wood Preservers Institute (WWPI) Best Management Practices[2] (BMPs) and Environmental Guide[3]. The purpose of this document is to assist regulators and project proponents in permitting projects having a low potential for creating adverse environmental effects and to identify requirements for a higher level of risk assessment for projects not passing the screening criteria. The NOAA Guidelines specifically recommends this screening approach and concludes that *"If a project passes this screening level assessment, then a more detailed site-specific risk assessment will not be required."* (See NOAA Guidelines information on Page 6.)

1. Introduction

The use of treated wood products in aquatic environments is a common practice developed to protect the wood from degradation by organisms capable of consuming wood. Treated wood is a concern in ESA and EFH consultations because wood preservatives do leach or migrate from pressure treated wood at known rates. The rate of leaching drops off rapidly following installation, but research has indicated that there is a potential for sublethal effects on listed species1. NOAA Fisheries has conducted extensive research into the potential impacts of treated wood to assist regulatory staff in making consultation determinations. This effort culminated in the publication of NOAA Guidelines in 2009 which conclude that:

[1] "The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions" October 12, 2009

[2] "Best Management Practices for the Use of Treated Wood in Aquatic and Other Sensitive Environments" (BMPs) Western Wood Preservers Institute, 2006 (Available at wwwpinstitute.org)

[3] Treated Wood in Aquatic Environments – A Specification and Environmental Guide to Selecting, Installing and Managing Wood Preservation Systems in Aquatic and Wetland Environments, August 1, 2006 (Available at wwpinstitute.org)

> *"Overall, the use of treated wood products in aquatic environments with the examined formulations (ACZA, CCA and creosote) could be acceptable in many proposed projects. However, the products cannot be considered categorically safe, and therefore, require assessment. Many projects, that still propose to use treated wood, may pass a screening level examination and require relatively little assessment for the treated wood related impacts. These determinations require a level of local knowledge that is applied on a case-by-case basis, or through regional or watershed based programmatic examinations."* (See NOAA Guidelines Page 35).

WWPI was involved in the development and review of the NOAA Guidelines document. WWPI has also actively worked with the industry to develop Best Management Practices and to evaluate the appropriate uses of treated wood in aquatic applications. As a continuing commitment to the environmentally responsible use of treated wood, WWPI has developed these assessment worksheets as a tool to assist NOAA Fisheries staff, federal action agencies and project applicants in determining potential effects on protected resources. The screening assessment tool in this document synthesizes the NOAA Guidelines and WWPI's documents into clear and concise worksheets that lead to consistent effect determinations. This document employs peer reviewed models of leaching rates and risk potential developed by WWPI and approved by NOAA Fisheries to support decision making.

The assessment worksheets that have been developed are designed to lead the user to one of five determinations regarding consultation. These "effect" determinations will be helpful in screening the potential impacts of the proposed project and assessing whether the project can proceed with informal or formal consultation with NOAA Fisheries.

1. A "no effect" determination;
2. A determination that with specific special conditions a "no effect" determination can be reached;
3. A "may affect, not likely to adversely affect" determination which may allow consultation to be completed through informal consultation;
4. A determination that with specific special conditions a "may affect, not likely to adversely affect" determination can be made which may allow consultation to be completed through informal consultation;
5. A "likely to adversely affect" determination which will require formal consultation.

An "effect" determination on treated wood applications should be based on both general preservative chemical information and project site-specific conditions. The driving factors in determining the potential effects of treated wood on aquatic resources are (See Figure 1, page 14):

- Site specific physical, biological, and chemical conditions
- Project design and characteristics
- Preservative system leaching rates and biological effects
- The transport and fate of the chemicals of concern
- Water quality standards and benchmarks for the chemicals of concern

The assessment process in its current draft can be used for the following types of projects that may utilize treated wood projects in the aquatic environment:

1. Boat Docks
2. Marinas and Wharfs
3. Piling Dikes
4. Automotive and Railroad Bridges
5. Foot Bridges/Boardwalks

The risk assessment model available at www.wwpinstitute.org is general in nature and can be used to assess any type of treated wood structure in any aquatic environment, including:

1. Retaining Walls and Sea Walls
2. Bridge Abutments

Projects involving construction in and over water may have potential impacts to NOAA trust resources unrelated to treated wood. Assessment of these related impacts are not addressed in this document and other guidance should be referenced to assess those potential effects.

2. Assessment of Potential Impacts

2.1 Assessment Framework

The NOAA Guidelines document concludes that many proposed projects involving the use of treated wood may be evaluated with a screening level assessment. The NOAA Guidelines identify threshold values derived from scientific research and policy documents to determine whether a project can be evaluated through a simplified screening assessment or might require a more rigorous risk assessment. The first step in assessing a project should be a review of any Programmatic Biological Opinions that categorically allow projects with less than a specified quantity of treated wood.

The assessment worksheets utilize a tiered approach to determining the level of detail necessary to reach an effect determination. These steps are listed below, shown in Figure 2, page 15 and discussed in greater detail in the following sections.

1. Categorical approval for actions covered in Programmatic Biological Opinions.
2. Level One Screening Assessment—uses lookup tables in this document to compare a specific project to maximum allowed quantities of material for standard structures.
3. Level Two Intermediate Risk Assessment—uses mathematical models with site specific inputs to assess risk.
4. Level Three Full Risk Assessment—involves more extensive collection of field data and analysis of potential mitigation measures.

These levels should be approached sequentially. For example, if a project proposes to use 50 or fewer copper treated piling on the lower Columbia River then, with a few other restrictions, the project would have been categorically approved under the Army Corp of Engineers SLOPES III Programmatic Biological Opinion[4]. If a project proposes to use more than 50 piling in the same location, then a Level One Screening Assessment can determine whether the project is below the threshold of concern for the project site and receive a no effect determination. If the project exceeds Level One Screening thresholds, then a Level Two Risk Assessment should be conducted.

2.2 Standards and Benchmarks

It is recognized that treated wood is a structurally appropriate and often the economically preferred material in many aquatic based projects. However, in the case of ESA and EFH habitats, it is essential that the environmental impact that may occur from use of the treated materials does not create conditions which are unacceptably adverse. The tools are available to evaluate project environmental parameters and evaluate the risk to aquatic resources posed by the project conditions. The goal is that environmental parameters and standards will not be exceeded after the project installation. The General Risk Assessment Model developed by WWPI may be consulted for the specific standards used in the development of this assessment process.

2.3 Preservative Systems

Mathematical leaching models and Level One Screening Assessment worksheets have been developed for wood products pressure treated with pentachlorophenol, creosote, or the copper based systems including Copper Naphthenate, Chromated Copper Arsenate (CCA), Ammoniacal Copper Zinc Arsenate (ACZA), Alkaline Copper Quat (ACQ), Copper Azole (CA-C), and Micronized Copper Quat (MCQ).

2.4 Site Specific Conditions

The site specific conditions include the physical setting of the project such as the type of water body (freshwater or marine), the velocity of the current in the water body, water depth, rainfall, sediment characteristics, pH, water temperature, and other background water quality characteristics. These factors are key inputs for assessment of treated wood applications and are used as inputs in the mathematic models and Level One Screening Assessment worksheets. The assumptions used in the simplified screening process are discussed in Section 3, Level One Screening Assessment.

[4] Programmatic Biological and Conference Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Revised Local Operating Procedures for Endangered Species (SLOPES III) to Administer Certain Activities Authorized or Carried Out by the Department of the Army in the State of Oregon and on the North Shore of the Columbia River, NMFS, November 30, 2004. **Note new versions of this programmatic biological and conference opinion are under development.*

2.5 Project Design

The exposure of treated wood to the aquatic environment can be from submerged wood structures such as piling or timbers, from overhead structures such as decking or from both. The proposed number of piling is a key factor for performing the screening assessment. There is a list of assumptions regarding the project design described in Section 3, Level One Screening Assessment.

All projects should be undertaken in conformance with the guidance provided in the “Best Management Practices for the Use of Treated Wood in Aquatic and Other Sensitive Environments” (BMPs) (Western Wood Preservers Institute, 2006). This includes BMPs for product production, quality assurance, installation and management. BMPs are available on line at www.wwpinstitute.org.

3. Level One Screening Assessment

The Level One Screening Assessment consists of comparing the proposed project with either regulatory water and sediment quality criteria or criteria that have been established through existing studies or programmatic consultation. Small projects that are predicted not to exceed these criteria pass the screening test. Larger projects or those that do not pass the screening will likely require a higher level of risk assessment. See Figure 2, page 15 for the decision tree.

For Level One Screening Assessment, a set of five worksheets have been developed that are specific to the preservative treatment system.

- Worksheet 1: Copper-Based Preservative Treated Wood for Freshwater Applications
- Worksheet 2: Copper-Based Preservative Treated Wood for Marine Water Applications
- Worksheet 3: Creosote Treated Wood in Marine Water Applications
- Worksheet 4: Pentachlorophenol Treated Wood in Freshwater Applications
- Worksheet 5: Screening Assessment for Copper-Based Preservative Treated Wood Decking and Creosote or Pentachlorophenol Piling

For a Level One Screening Assessment, Figure 3, page 19 shows which decision tree should be used for each preservative. It also indicates how to handle a project with multiple types of preservative treated wood. A special worksheet (Table 5, page 34) has been developed for projects with copper treated decking supported by steel, concrete or piling treated with creosote or pentachlorophenol. This special worksheet can also be used to assess the maximum area of decking for projects with no supporting piling. Projects with other combinations of preservative systems must be separated into components and evaluated for each preservative. For projects with several types of copper-based preservatives, the separation approach would not provide a clear picture of expected concentration and this type of project will need to go to a Level Two or Three Risk Assessment.

The latest peer reviewed version of the WWPI environmental exposure model was used to develop a series of screening tables for various preservatives. The NOAA Guidelines stated that “Overall, the models consistently overestimate water column concentrations because of simplifying assumptions.” The simplified Screening Assessment assumptions were made to allow the user to arrive at a conservative finding in determining if the project would qualify for a “no effect” determination. These assumptions are summarized below and are the basis for the tables included in the worksheets:

- Piling are spaced 3.0 meters apart (~10 feet) and each piling supports an overhead deck structure covering an area of 3.0 x 3.0 meters = 9 m^2 or approximately 100 ft^2 of decking including associated railing.
- The table piling numbers are those placed in a row paralleling the current vector. In general, that will be along a vector paralleling the shoreline.
- The assessment conservatively assumes that all treated wood components are placed on Day 0.5.
- The anticipated lifespan of the project is 35 years.
- Restrictions on oil borne or oil-based preservatives (pentachlorophenol and creosote) are based on accumulation of the active ingredients in sediments.
- In freshwater, current speeds are an average of those found at mid depth within the project's footprint.
- In tidally driven marine environments, the current speed is the Maximum tidal current speed.[5] Based on this maximum speed, the model computes average speeds for determining sediment concentrations and the mean speed within half an hour either side of slack tide for determining maximum water column concentrations of the chemicals of concern.
- Water depths within the footprint of the project are not critical but are assumed to be spatially similar and equal to 2.0 m depths.
- Freshwater environments: pH = 6.5; Temperature = 15 ^oC, background copper = 1.5 µg Cu/L, Hardness = 50 mg $CaCO_3$/L.
- Marine environments: Salinity = 30 PSU, background copper = 0.5 µg Cu/L
- Sediment environment: Density = 2.6 g/cm^3; Sediment Total Organic Carbon = 1.0%; Background Sediment Copper = 15 mg Cu/kg; Background concentrations of PAH (Creosote) and Pentachlorophenol = 0.0.
- Annual rainfall = 100 cm/year (40 inches/year); Rainwater pH = 6.5. No significant storms occur during or immediately after construction.
- Pentachlorophenol assessments were conducted assuming a conservatively low sediment redox potential of 50 mV.

Figures 3-A, 3-B, and 3-C, pages 20, 21, and 22 show the decision trees for the assessment worksheets for copper-based preservatives, creosote, and pentachlorophenol treated wood and reference the tables in the worksheets. The worksheets have been developed so that the evaluator can walk through the process and reference the pre-calculated amount of treated wood that would be allowed under each scenario for a "No-Effect Determination."

If the actual site specific conditions are less conservative than the ones listed above, the WWPI Risk Assessment Model may be used to check if the project could still be considered to have "no effect." Revising the model input to reflect the project conditions would be done as a Level Two Intermediate Risk Assessment.

[5] See definition of Maximum Tidal Current Speed in Appendix A – Information Sources

4. Procedures for Using Level One Assessment Worksheets

The assessment worksheets are designed to compile the essential information for assessing the potential impacts of using treated wood in aquatic environments and lead the user through a series of questions to come to an effects determination.

Step 1: Complete Project Information Form

The Project Information Form (attached) includes basic information to determine its location, type of project, scale, and the preservative systems proposed for use.

Step 2: Preliminary Assessment of Risk

Once the basic project information has been assembled in Step 1, the project should be evaluated following the steps shown in Figure 2, page 14. The first step in the tiered assessment process is to check to see if the project qualifies for a Categorical Approval under a Programmatic Biological Opinion. If the project does qualify, then the project may be approved on that basis. The Level One Screening Assessment is the next step and is further described in Step 3 below.

Step 3: Complete Appropriate Assessment Worksheet Based on Type of Wood Preservation System

Copper based, pentachlorophenol, and creosote preservative systems have different effects on aquatic organisms, so separate worksheets have been developed to evaluate them. The Assessment Worksheets require more data in addition to the Project Information Form. See Appendix A for sources of additional information.

- Project Information—enter pertinent information on the project design in Part A of the worksheet. This information focuses on the amount of treated wood that will be placed in the aquatic environment. Enter responses to site specific questions in Part B. This information focuses on current velocities and sediment conditions and may require study in the field for more accurate determinations.
    - For assessment of creosote applications, a simple field measure of reduction oxidation (redox) potential is required. The redox potential discontinuity depth is simply the distance in centimeters below the sediment surface at which the sediment color changes to dark gray or black. The black color is evidence of iron sulfides associated with anaerobic conditions. Anaerobic conditions slow the degradation of aromatic hydrocarbons in sediments. To measure the redox potential discontinuity, insert a clear plastic or glass cylinder vertically into the sediment and measure the depth of the discontinuity in centimeters.
- Assessment—the worksheet includes a table of maximum number of piling (and associated decking above water) that can be installed in a water body without equaling or exceeding water or sediment quality criteria. These numbers are derived from a mathematical model calibrated with field data.
    - If the number of piling (or the square footage of decking above water) proposed is less than or equal to the appropriate number in the table

for the site's current speed and the preservative type, then the determination related to treated wood should be "no effect."

- If the number of piling or decking surface area proposed is greater than the appropriate number in the table for the site's current speed and the preservative type, then a Level Two Intermediate Risk Assessment should be conducted.

5. Level Two Intermediate Risk Assessment

5.1 Level Two Considerations

If it is determined that a project cannot be approved under the Level One Screening Assessment, then a Level Two Intermediate Risk Assessment should be conducted using available modeling tools including Box Models or the recognized industry Risk Assessment Models available at www.wwpinstitute.org (See Figure 2-B, page 17). A Level Two Intermediate Risk Assessment should also be considered if the proposed project falls into the following categories.

- Projects that don't fit the generic piling and deck configuration used for the Level One Screening Assessment.
- Projects in industrial areas where there may be high background levels of metals or Polycyclic Aromatic Hydrocarbons (PAHs).
- Projects in close proximity (<50 feet) to other projects involving more than 20 piling treated with a similar preservative (creosote, copper based, etc.).

The following preservative-specific criteria should also be considered to determine if a Level Two Intermediate Risk Assessment is applicable:

Creosote (freshwater or marine)
• The sediments are black and smell of hydrogen sulfide.
• Maximum current speeds are less than three cm/sec
• Project involves more than four piling placed in a row parallel to the currents

Copper Naphthenate (freshwater)
• Maximum current speeds less than 1.0 cm/sec
• Project involves more than six piling paralleling the currents

Waterborne treatments (freshwater)
• Maximum current speeds less than 1.0 cm/sec or:

- CCA-C. Project involves more than 100 piling parallel to the currents
- ACZA. Project involves more than 25 piling parallel to the currents
- CA-B. Project involves more than two timbers parallel to the currents
- ACQ-B. Project involves more than two timbers parallel to the currents
- The pH of the receiving water is less than 5.5

Waterborne treatments (marine environments)

• Maximum current speeds less than 1.5 cm/sec or:

- CCA-C. Project involves more than four piling parallel to the currents
- ACZA. Project involves more than two piling parallel to the currents

5.2 Expanded Environmental Parameters

In addition to the environmental parameters identified above, a Level Two Assessment will require determinations or estimations of additional parameters as input to the models:

- Salinity
- Hardness
- Sediment
- Redox potential
- Existing copper concentrations in water and sediments
- Applicable water quality and sediments standards
- Existing Water Quality and Sediment measurements
- Retention Levels for preservative
- Measured current speeds within the project's footprint at mid depth

5.3 Interpreting Model Results

A comparison of the model output (including existing background concentrations in sediment and water) with the water and sediment quality standards will indicate if the predicted concentrations are acceptable. The information can then be used in an informal consultation with approval as a "may affect, but is unlikely to adversely affect" decision. Or the information may be used in a Biological Opinion and full Consultation or a decision to deny or reduce the use of treated wood in the project.

6. Level Three Full Risk Assessment

A Level Three Full Risk Assessment (See Figure 2-C, page 18) should be considered when the Level Two Intermediate Risk Assessment indicates that concentrations may exceed standards. The Level Three will likely require collection of field data to provide a more accurate characterization of biological, chemical and physical conditions of the site than needed for a Level Two Intermediate Risk Assessment. The strategy for performing a Level Three Risk Assessment assumes that additional site specific information can be used in conjunction with the assessment of potential mitigating measures (e.g. modified materials, coatings, design changes, etc.) to arrive at a "no effect" or a "may affect – not likely to adversely affect" finding, which would allow the project to proceed.

FIGURES

Figure 1 - Treated Wood Risk Assessment

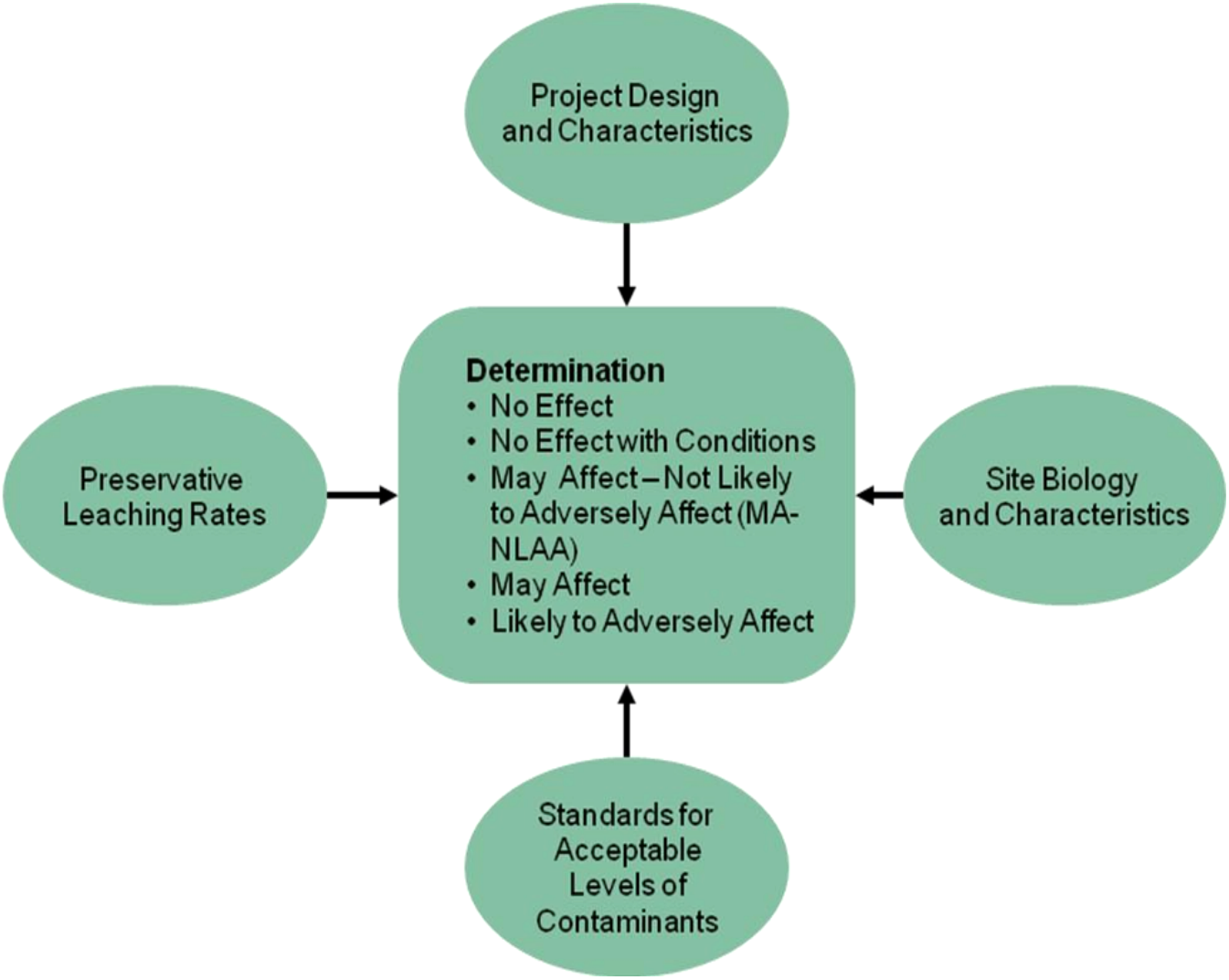


Figure 2 - Tiered Risk Assessment Approach

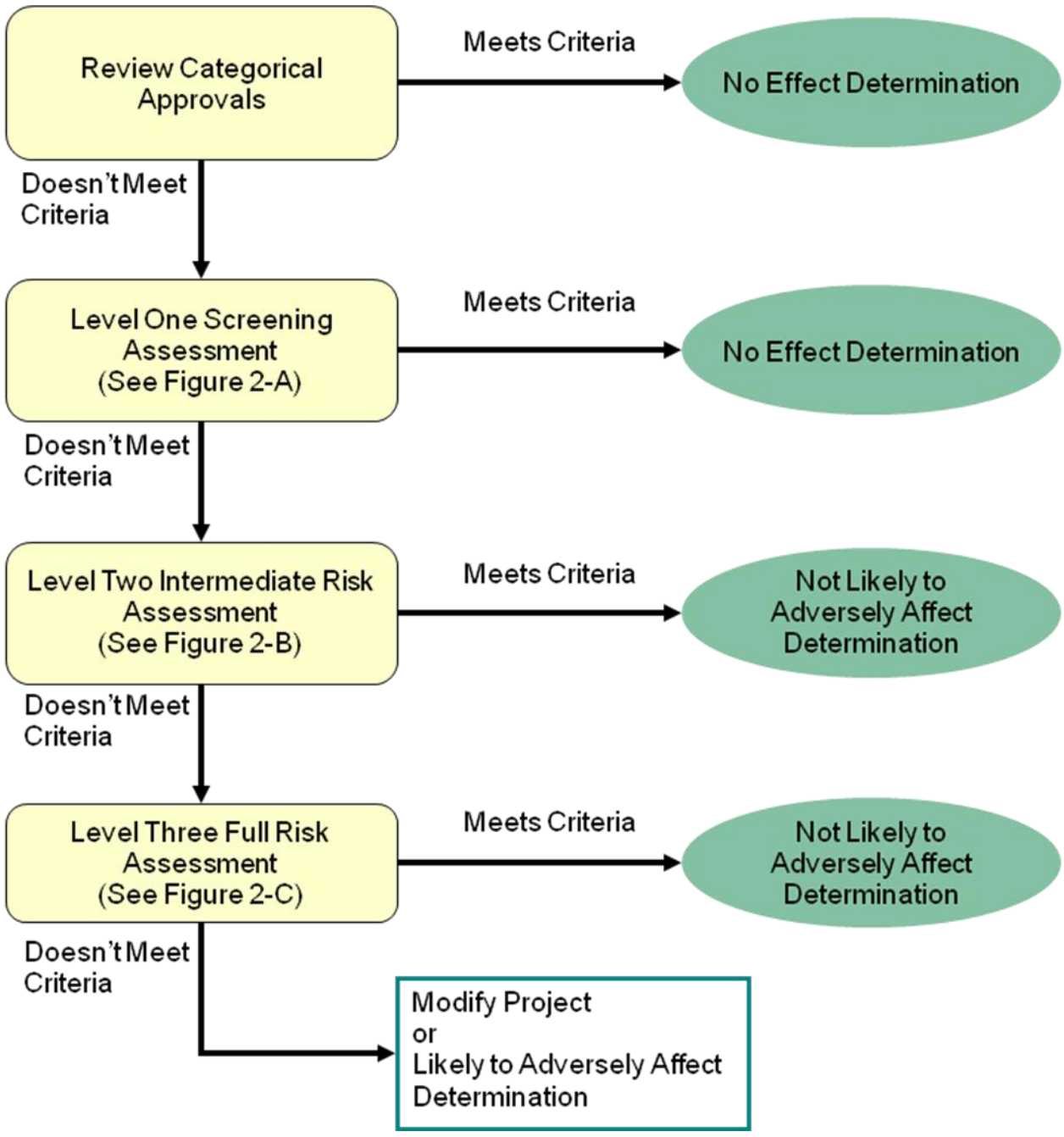


Figure 2A - Level One Screening Assessment

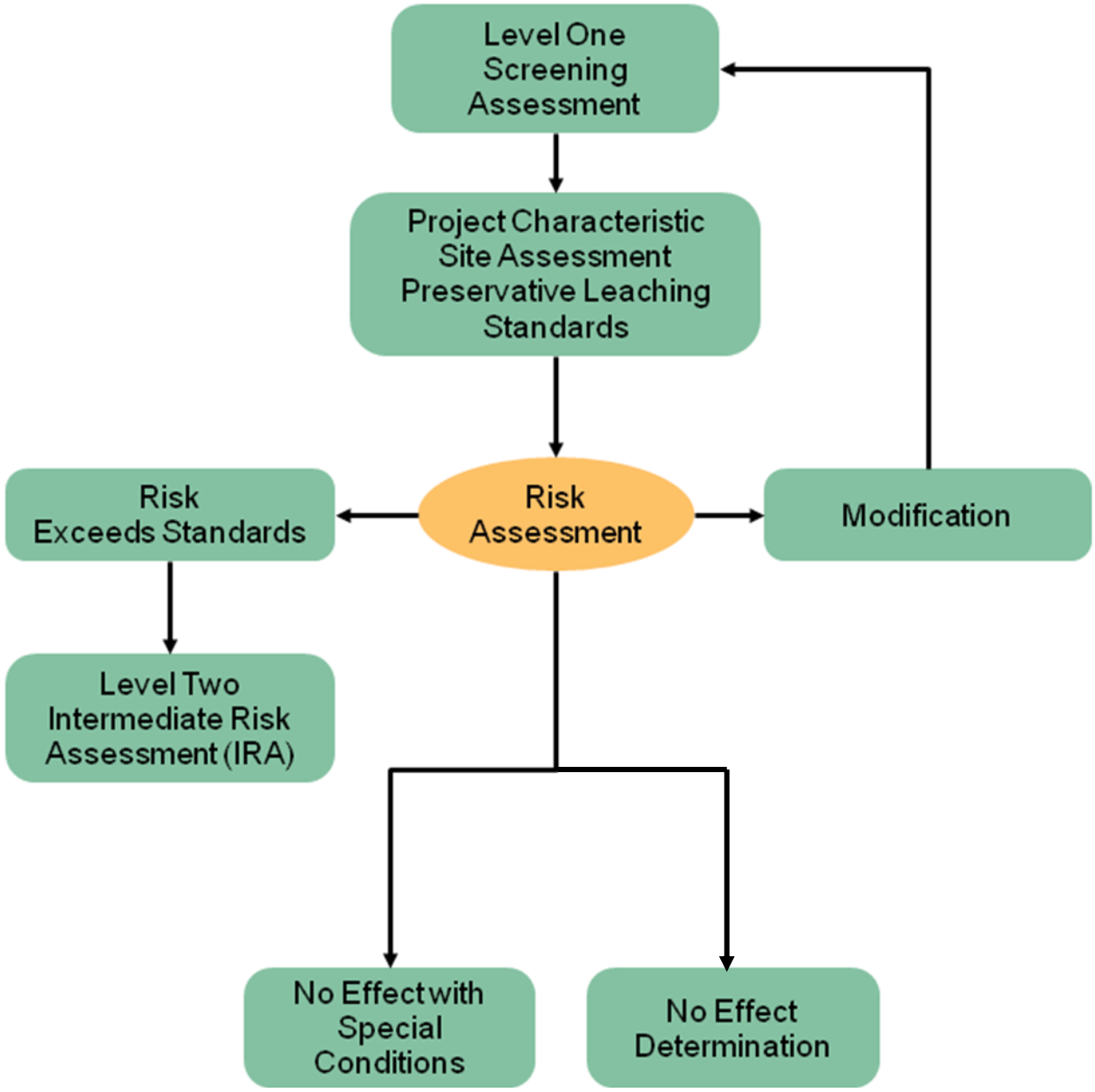


Figure 2B - Level Two Intermediate Risk Assessment

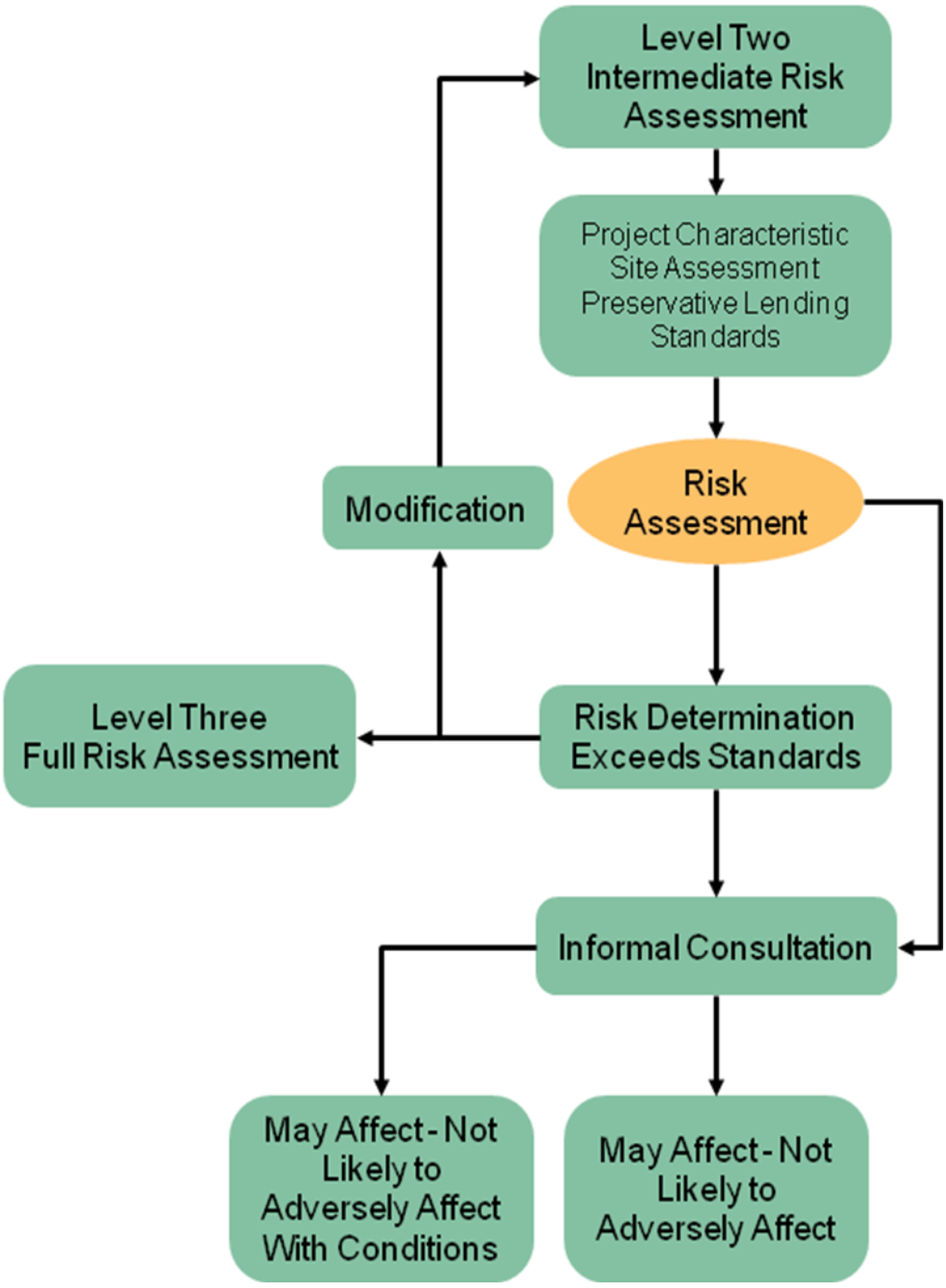


Figure 2C - Level Three Full Risk Assessment

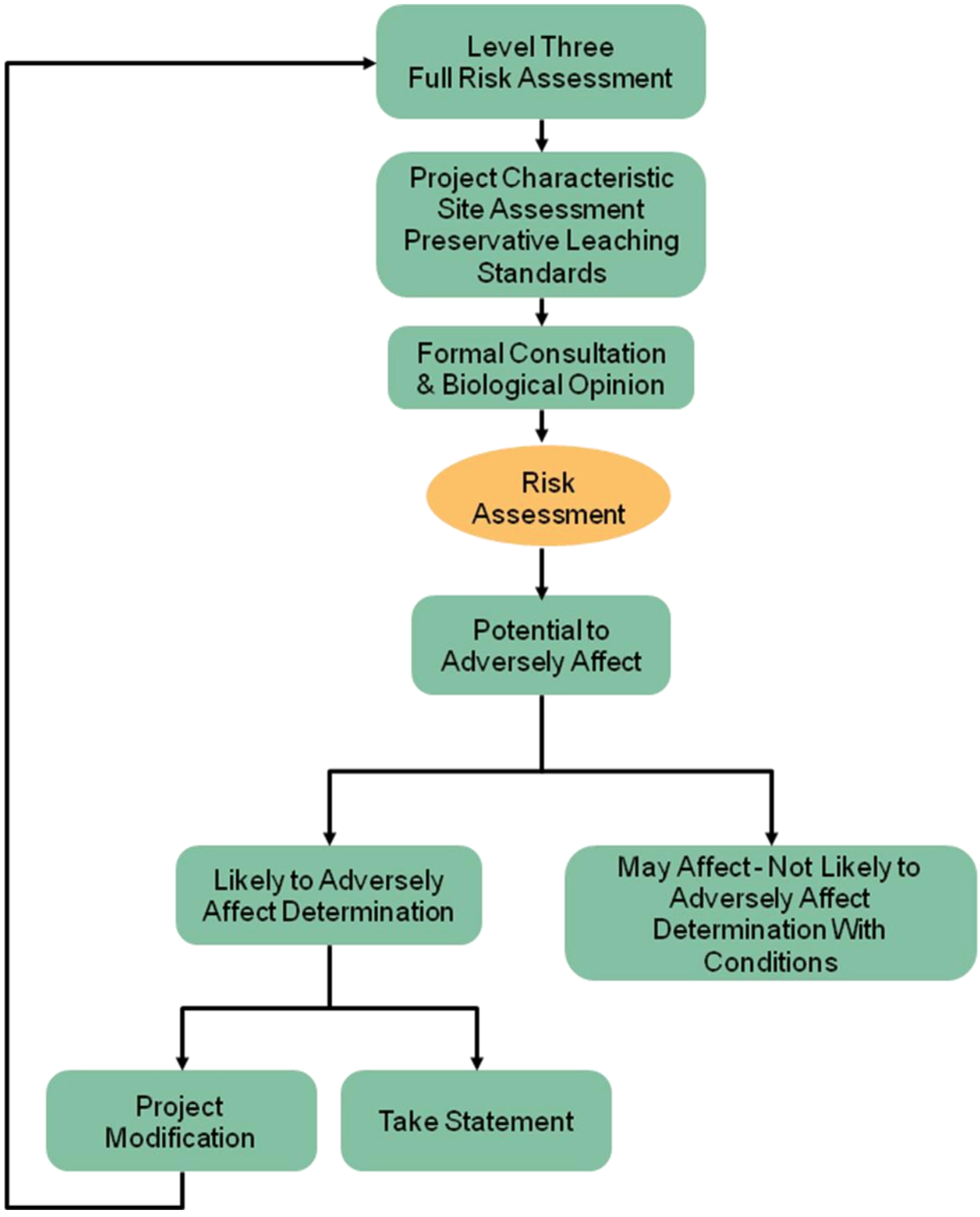


Figure 3 - Level One Screening Assessment

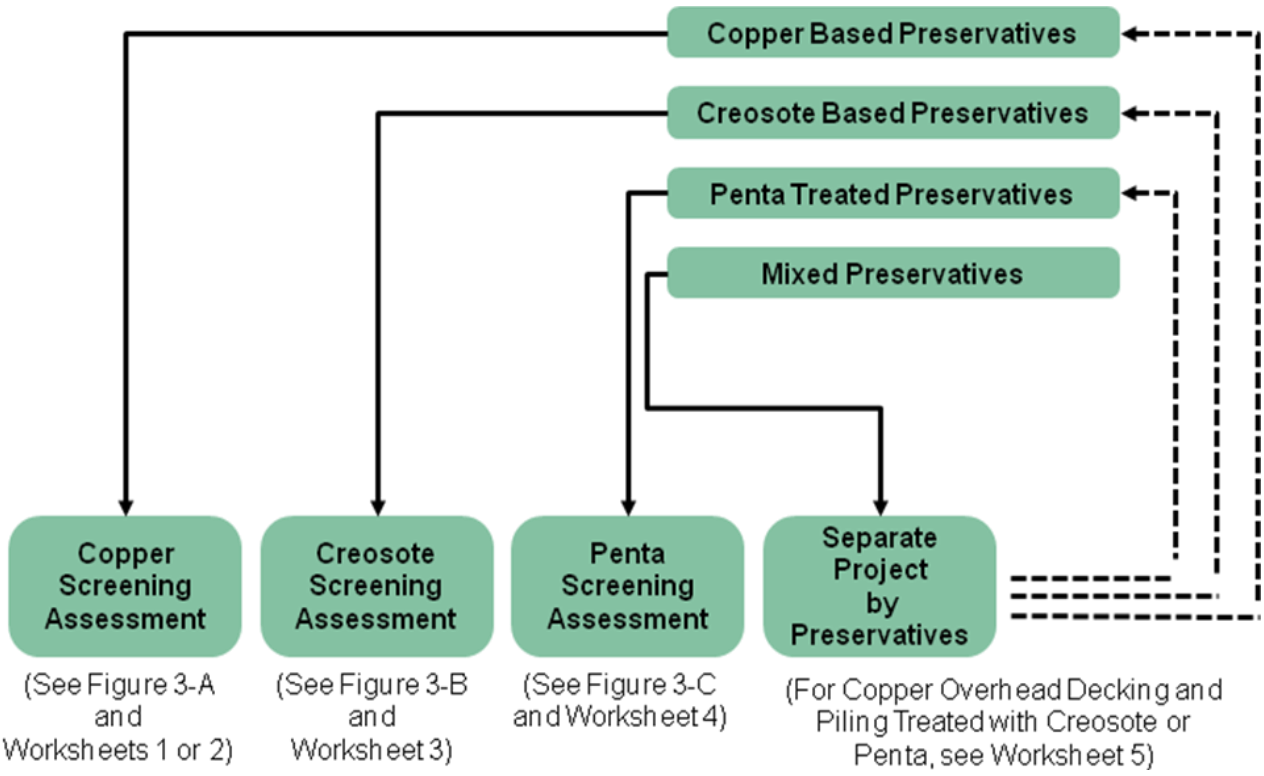


Figure 3A - Copper Based Preservative Treated Wood in Aquatic Applications

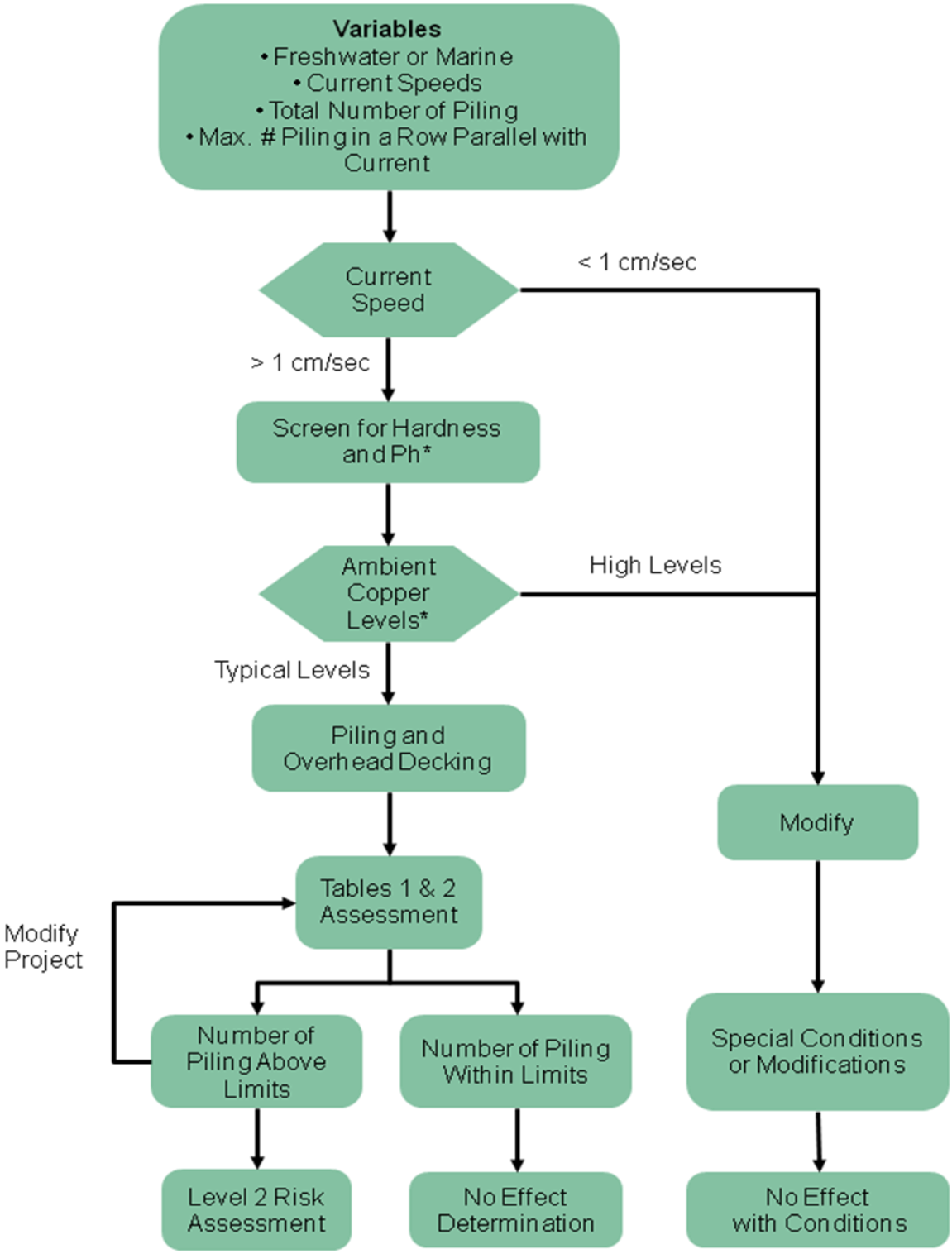


Figure 3B - Creosote Preservative Treated Wood Used in Aquatic Applications

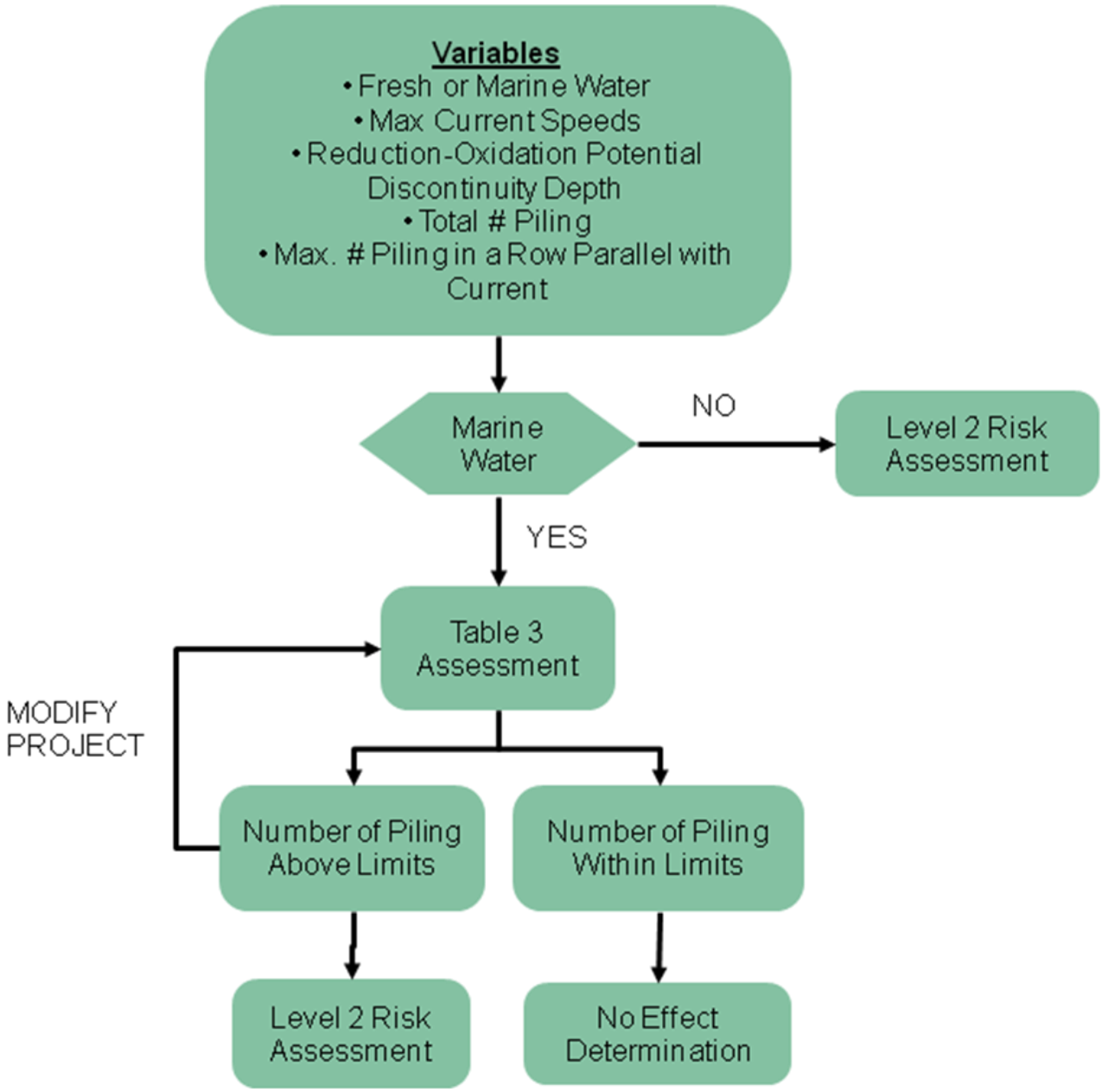
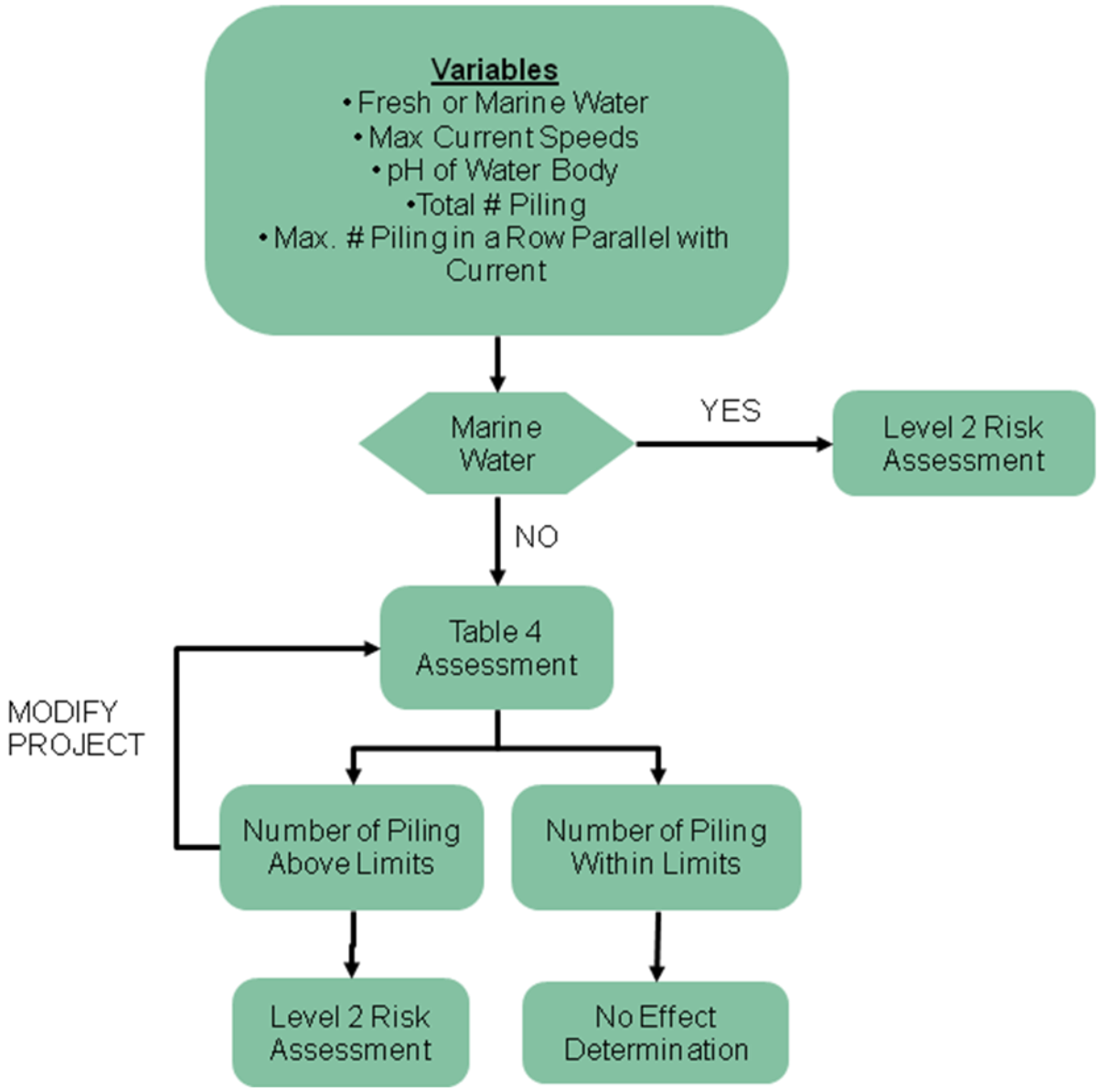


Figure 3C - Pentachlorophenol (Penta) Preservative Treated Wood used in Aquatic Applications



WORKSHEETS & FORMS

(1) APPLICANT INFORMATION

Name and Address	Business Phone # Home Phone # Fax # Email
Authorized Agent Name and Address Check one Consultant ☐ Contractor ☐	Business Phone # Home Phone # Fax # Email

(2) PROJECT LOCATION

Street, Road or Other Descriptive Location	Legal Description (attach *tax lot map*)			
	Township	Range	Section	Quarter/Quarter

In or near (City or Town)	County	Tax Map #	Tax Lot #
Wetland/Waterway (pick one)	River Mile (if known)	Latitude (in DD.DDDD format)	Longitude (in DD.DDDD format)

Directions to the site	

(3) PROPOSED PROJECT INFORMATION

Type: Private Pier ☐ Marina/ Wharf ☐ Sea-Wall / Bulkhead ☐ Bridge / Boardwalk ☐

Brief Description:

Structure and Treatment System

Structure	Specifications					Treatment System		
Piling	Number ☐	Diameter ☐	Length ☐	Spacing ☐	Copper ☐	Creosote ☐	Penta ☐	
Structural Timber (in-water)	Number ☐	Dimension ☐	Length ☐	Area ☐	Copper ☐	Creosote ☐	Penta ☐	
Structural Timber (above water)	Number ☐	Dimension ☐	Length ☐	Area ☐	Copper ☐	Creosote ☐	Penta ☐	

Construction Timing	Start Date	End Date	Estimated number of days for completion	

Project Information Form

SCREENING ASSESSMENT WORKSHEET #1

COPPER-BASED PRESERVATIVE TREATED WOOD FOR FRESHWATER APPLICATIONS

Assessment of Piling and Overhead Decking

A. Project Information

A1. Maximum # of piling in a row parallel with current……. A1 _____
A2. Specific copper based preservative to be used for piling...…….... A2 _____
A3. Specific copper based preservative to be used for decking……... A3 _____

B. Site Information

B1. Average Current Speeds (cm/sec)……. B1_____

C. Assessment

In the tables below, identify the preservative for the piling (A2) that matches the title of the table, the above water structure treatment type (A3) down the left side of the table, and the current speed across the top of the table, and find the maximum allowed number of piling that can be placed in a row paralleling the currents.

C1. Maximum allowed piling for current speed in B1…… C1_____
C2. If the number of piling in C1 is greater than or equal to the number proposed in A1, then the use of treated wood should meet the criteria for a "no effect" determination…… C2_____
C3. If the number of piling in C1 is less than A1, modify the design or proceed to a Level Two Intermediate Risk Assessment…… C3_____

How to Use Tables 1A– 1C:
Number of piling allowed in association with various treated piling types supporting above water decks treated with the same or other preservatives in freshwater. Assumes pilings are spaced 3 meters apart and each piling supports an above water deck structure covering an area of 9 square meters (approximately 100 square feet). Copper concentrations will not exceed U.S. EPA Acute Water Quality Criteria at 50 mg CaCO3/L hardness assuming a background of 1.5 μ_g Cu/L. For other assumptions, see Section 3—Level One Screening Assessment.

Table 1A: CCA-C Treated Piling – Maximum Number of piling that can be placed in a row paralleling the currents and the square feet (sf) of decking allowed above water using the Screening Assessment Method

Above water structure treatment	Steady State Freshwater Current Speeds (cm/sec)									
	0.5 cm/sec		1 cm/sec		2.5 cm/sec		5 cm/sec		10 cm/sec	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
ACZA	27	2,700sf	30	3,000sf	30	3,000sf	>30	3,000sf	30	3,000sf
ACQ-B or C	2	200sf	4	400sf	12	1,200sf	24	2,400sf	30	3,000sf
CA-B	1	100sf	3	300sf	9	900sf	18	1,800sf	30	3,000sf
Micronized Copper	30	3,000sf	30	3,000sf	30	3,000sf	>30	3,000sf	30	3,000sf
Copper Naphthenate	2	200sf	4	400sf	10	1,000sf	21	2,100sf	30	3,000sf

Note: A project with over 30 piling in a row parallel with current should be evaluated with the Level Two Intermediate Risk Assessment.

Table 1B: ACZA Treated Piling– Maximum Number of piling that can be placed in a row paralleling the currents and the square feet (sf) of decking allowed above water using the Screening Assessment Method

Above water structure treatment	Steady State Freshwater Current Speeds (cm/sec)									
	0.5 cm/sec		1 cm/sec		2.5 cm/sec		5 cm/sec		10 cm/sec	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
ACZA	13	1,300sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
ACQ-B or C	2	200sf	4	400sf	11	1,100sf	22	2,200sf	30	3,000sf
CA-B	1	100sf	3	300sf	8	800sf	16	1,600sf	30	3,000sf
Micronized Copper	22	2,200sf	30	3000sf	30	3,000sf	30	3,000sf	30	3,000sf
Copper Naphthenate	4	400sf	11	1,100sf	9	900sf	19	1,900sf	30	3,000sf

Note: A project with over 30 piling in a row parallel with current should be evaluated with the Level Two Intermediate Risk Assessment.

Table 1C: Copper Naphthenate Treated Piling– Maximum Number of piling that can be placed in a row paralleling the currents and the square feet (sf) of decking allowed above water using the Screening Assessment Method

Above water structure treatment	Steady State Freshwater Current Speeds (cm/sec)									
	0.5 cm/sec		1 cm/sec		2.5 cm/sec		5 cm/sec		10 cm/sec	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
ACZA	20	2,000sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
ACQ-B or C	2	200sf	2	200sf	11	1,100	22	2,200sf	30	3,000sf
CA-B	1	100sf	1	100sf	8	800sf	16	1,600sf	30	3,000sf
Micronized Copper	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
Copper Naphthenate	1	100sf	2	200sf	9	900sf	19	1,900sf	30	3,000sf

Note: A project with over 30 piling in a row parallel with current should be evaluated with the Level Two Intermediate Risk Assessment.

SCREENING ASSESSMENT WORKSHEET #2

COPPER-BASED PRESERVATIVE TREATED WOOD FOR
MARINE WATER APPLICATIONS

Assessment of Piling and Overhead Decking

A. Project Information

A1. Maximum # of piling in a row parallel with current……. A1 _____
A2. Specific copper based preservative to be used for piling..…….... A2 _____
A3. Specific copper based preservative to be used for decking……... A3 _____

B. Site Information

B1. Maximum tidal current speed (see Appendix A for definition)
(cm/sec)…….…….. B1 _____

C. Assessment

In the tables below, identify the preservative for the piling (A2) that matches the title of the table, the above water structure treatment type (A3) down the left side of the table, and the current speed across the top of the table, and find the maximum allowed piling.

C1. Maximum allowed piling for current speed in B1…….…….. C1 _____
C2. If the number of piling in C1 is greater than or equal to the number proposed in A1, then the use of treated wood should meet the criteria for a "no effect" determination……. C2_____
C3. If C1 is less than A1, modify the design or proceed to a Level Two Intermediate Risk Assessment……... C3 _____

How to Use Tables 2A-2B:
Number of piling allowed in association with various treated piling types supporting above water decks treated with the same or other preservatives in marine environments. Copper concentrations will not exceed U.S. EPA Acute Marine Water Quality Criteria of 4.8 µg Cu/L assuming a background of 0.5 µg Cu/L. Assumes piling are spaced 3 meters apart and each piling supports an overhead deck structure covering an area of 9 square meters (approximately 100 sf). For other assumptions, see Section 3—Level One Screening Assessment.

Table 2A: CCA-C Treated Piling– Maximum Number of piling that can be placed in a row paralleling the currents and the square feet (sf) of decking allowed above water using the Screening Assessment Method

	Maximum current speed in harmonically driven marine environments (cm/sec)									
Above water treatment	2.5 cm/sec		5 cm/sec		7.5 cm/sec		10 cm/sec		15 cm/sec	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
ACZA	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
ACQ-B or C	1	100	3	300sf	4	400sf	30	3,000sf	30	3,000sf
CA-B	0	0sf	2	200sf	3	300sf	30	3,000sf	30	3,000sf
Micronized Copper	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
Copper Naphthenate	2	200	6	600sf	12	1,200sf	20	2,000sf	30	3,000sf

Note: A project with over 30 piling in a row parallel with current should be evaluated with the Level Two Intermediate Risk Assessment.

Table 2B: ACZA Treated Piling– Maximum number of piling that can be placed in a row paralleling the currents and the square feet (sf) of decking allowed above water using the Screening Assessment Method

	Maximum current speed in harmonically driven marine environments (cm/sec)									
Above water treatment	2.5 cm/sec		5 cm/sec		7.5 cm/sec		10 cm/sec		15 cm/sec	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
ACZA	18	1,800sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
ACQ-B or C	1	100sf	2	200sf	4	400sf	7	700sf	15	1,500sf
CA-B	10	1,000sf	2	200sf	3	300sf	5	500sf	11	1,100sf
Micronized Copper	30	3,000sf	30	3,000sf	30	300sf	30	3,000sf	30	3,000sf
Copper Naphthenate	1	100sf	6	600sf	12	1,200sf	19	1,900sf	30	3,000sf

Note: A project with over 30 piling in a row parallel with current should be evaluated with the Level Two Intermediate Risk Assessment.

SCREENING ASSESSMENT WORKSHEET #3

CREOSOTE TREATED WOOD IN
MARINE WATER APPLICATIONS

Assessment of Piling and Overhead Decking

A. Project Information

A1. Maximum # of piling in a row parallel with current..……...……. A1 _____

B. Site Information

B1. Maximum tidal current speed (see Appendix A for definition)
(cm/sec)……..…….……..….. B1 _____
B2. Depth of reduction-oxidation (redox) potential discontinuity (cm)……..…. B2 _____
(See Section 4, Step 3 of Procedures for Using Level 1 Assessment Worksheets for a discussion of redox potential discontinuity.)

C. Assessment

In the table below, identify the appropriate redox potential discontinuity depth on the left side of the table, the maximum current speed across the top, and find the maximum allowed number of piling. Numbers in green shaded cells meet criteria. Numbers in yellow shaded cells should be evaluated in a Level Two Intermediate Risk Assessment. Enter the number in the space for C1. Enter the color of the cell in C2.

C1. Maximum allowed piling under screening assessment methods……. C1 _____
C2. Color of cell for site conditions (yellow [1] or green [2])……..…. C2 _____
C3. If the number of piling in C1 is greater than or equal to the number proposed in A1, **AND** the cell color is green, then the use of treated wood should meet the criteria for a "no effect" determination…….. C3 _____
C4. If the number of piling in C1 is less than A1 **OR** the cell color for the site conditions is yellow, modify the design or proceed to a Level Two Intermediate Risk Assessment…… C4 _____

How To Use Table 3:
Number of creosote treated piling in a row paralleling the current where the piling support creosote treated deck in marine water. The screening criteria are based on not exceeding the Washington State Sediment Quality Criteria for Polycyclic Aromatic Hydrocarbon (PAH) at 1 percent TOC = 13.3 mg ΣPAH/kg. Assumes piling is spaced 3 meters apart and each piling supports a treated overhead deck structure above water covering an area of 9 square meters (3 meters by 3 meters) or approximately 100 ft2. For other assumptions, see Section 3—Level One Screening Assessment.

Table 3: Creosote Treated Piling – Maximum Allowable Piling Under Screening Assessment Methods

Depth of Redox Potential Discontinuity (cm)	Maximum Current Speed (cm/sec)								
	0.5	**1**	**2**	**3**	**4**	**5**	**6**	**10**	**15**
0	0	0	0	1	1	1	2	3	5
0.5	0	0	0	1	1	2	2	4	6
1	0	0	0	1	2	3	3	5	8
1.5	0	0	1	2	3	4	4	7	11
2	0	1	2	3	4	5	6	10	16
3	0	2	4	5	7	9	11	19	29
4	0	4	7	11	15	19	23	38	57

* **Green** shaded cells meet criteria
* **Yellow** shaded cells should be evaluated in a Level Two Intermediate Risk Assessment.

SCREENING ASSESSMENT WORKSHEET #4

PENTACHLOROPHENOL TREATED WOOD IN
FRESHWATER APPLICATIONS

Assessment of Piling and Overhead Decking

A. Project Information

A1. Maximum # of piling in a row parallel with current ……..... A1 _____

B. Site Information

B1. Average (steady state) current speeds (cm/sec) ……..……. B1_____

B2. pH of waterbody …….. B2_____

C. Assessment

In the table below, identify the appropriate pH on the left side of the table, the current speed across the top of the table, and find the maximum allowed number of piling under screening assessment method. Numbers in green shaded cells meet criteria. Numbers in yellow shaded cells should be evaluated in a Level Two Intermediate Risk Assessment. Enter the number in the space for C1. Enter the color of the cell in C2.

C1. Maximum allowed piling under screening assessment methods…… C1 _____
C2. Color of cell for site conditions (yellow [1] or green [2])……..C2 _____
C3. If the number of piling in C1 is greater than or equal to the number proposed in A1, **AND** the cell color is green, then the use of treated wood should meet the criteria for a "no effect" determination……. C3 _____
C4. If the number of piling in C1 is less than A1 **OR** the cell color for the site conditions is yellow, modify the design or proceed to a Level Two Intermediate Risk Assessment….. C4 _____

How To Use Table 4:
Number of pentachlorophenol treated piling in a row paralleling the current where the piling support a pentachlorophenol treated deck above freshwater. The screening criteria are based on not exceeding the Sediment Quality Criteria at 1 percent TOC = 0.40 mg penta/kg. Assumes piling is spaced 3 meters apart and each piling supports a treated overhead deck structure covering an area of 9 square meters (3 meters by 3 meters) or approximately 100 ft2. For other assumptions, see Section 3—Level One Screening Assessment.

Table 4: Pentachlorophenol Treated Piling – Maximum Allowable Piling and allowable square feet (sf) of decking above water using the Screening Assessment Method

	Average (Steady State) Freshwater Current Speeds (cm/sec)									
pH	0.5		1		2.5		5		10	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
5.5	2	200 sf	5	500 sf	13	1300 sf	26	2600 sf	52	5200 sf
6.0	2	200 sf	4	400 sf	10	1000 sf	21	2100 sf	43	4300 sf
6.5	1	100 sf	3	300 sf	8	800 sf	17	1700 sf	35	3500 sf
7.0	1	100 sf	2	200 sf	7	700 sf	14	1400 sf	29	2900 sf
7.5	1	100 sf	2	200 sf	6	600 sf	12	1200 sf	24	2400 sf
8.0	1	100 sf	2	200 sf	5	500 sf	10	1000	20	2000 sf
8.5	0	0	1	100 sf	4	400 sf	8	800	16	1600 sf

SCREENING ASSESSMENT WORKSHEET #5

COPPER-BASED PRESERVATIVE TREATED WOOD DECKING AND CREOSOTE OR PENTACHLOROPHENOL PILING

Assessment of Piling and Overhead Decking

A. Project Information

A1. Maximum # of piling in a row parallel with current……. A1 _____

A2. Specific copper based preservative to be used for overhead decking…….. A2 _____

A3. Treatment system for piling (Creosote [1] or Pentachlorophenol [2] or N/A). A3 _____

NOTE: Creosote should be used in marine environments and pentachlorophenol should be used in freshwater environments.

B. Site Information

B1. Average (freshwater) or maximum tidal current speed (see Appendix A for definition) (cm/sec)……..……. B1 _____

B2. Salinity of Waterbody (fresh or salt water)……..... B2 _____

C. Assessment

In the tables below, identify the preservative for the decking (See A2) on the left side of the table, the current speed across the top of the table (See B1), and find the maximum number of allowed piling.

C1. Maximum allowed piling for current speed and preservative type……..…… C1 _____

C2. If the number of piling in C1 is greater than or equal to the number proposed in A1, then the use of copper treated wood for overhead structures should meet the criteria for a "no effect" determination…….. C2 _____

C3. If C1 is less than A1, modify the design or proceed to a Level Two Intermediate Risk Assessment…….. C3 _____

How to Use Table 5:

Number of creosote or pentachlorophenol treated piling allowed in association with various copper treated decks above water. The screening criteria for creosote are based on not exceeding the Washington State Marine Sediment Quality Criteria for Polycyclic Aromatic Hydrocarbon (PAH) at 1 percent TOC = 13.3 mg ΣPAH/kg. The screening criteria for pentachlorophenol are based on not exceeding the New York State Freshwater Sediment Quality Criteria at 1 percent TOC = 0.40 mg penta/kg. The assessment assumes pilings are spaced 3 meters apart and each piling supports a deck structure above water covering an area of 9 square meters (approximately 100 square feet). For other assumptions, see Section 3—Level One Screening Assessment.

Copper contributions from overhead structures only. Note that in addition to checking the maximum number of piling given for creosote in marine environments and pentachlorophenol in freshwater, the project must also not exceed the following maximum square footage of structures above water preserved with copper-containing preservatives per row of piling in order to not exceed copper water quality criteria. The table shows the number of piling and the associated square footage of decking for the overhead structure and can be applied to both fresh and marine waters.

Table 5: Maximum square footage of overhead structure treated with copper based preservatives that can be placed in a ten foot wide row paralleling the current vector when the overhead structure is supported on steel, concrete, creosote or pentachlorophenol preserved piling using the Screening Assessment Method.

	Average (freshwater) or Maximum (tidal) Current Speeds (cm/sec)									
Above water treatment	**0.5**		**1**		**2.5**		**5**		**10**	
	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking	Piling	Decking
ACZA	27	2,700sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
ACQ-B or C	2	200sf	4	400sf	12	1,200sf	24	2,400sf	30	3,000sf
CA-B	1	100sf	3	300sf	9	900sf	18	1,800sf	30	3,000sf
Micronized Copper	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf	30	3,000sf
Copper Naphthenate	5	500sf	11	1,100sf	28	2,800sf	30	3,000sf	30	3,000sf

APPENDIX A

INFORMATION SOURCES

AND

DEFINITIONS

INFORMATION SOURCES

Velocity Information - Treated Wood in Freshwater

A. Project Information—this information is compiled on the Project Information Form from the design drawings.
B. Site Information—current velocities for the project site can be collected in the field or estimated based on United States Geological Survey (USGS) stream gauges on the project water body. USGS stream gauge data can be accessed at http://waterdata.usgs.gov/nwis
    - Click on the "Surface Water" button
    - Click on the "Daily Data" button
    - On the Choose Site Selection Criteria page, Check the State/Territory box and click the "Submit" button
    - On the Select sites" page, select the State where the project is located and click the "Submit" button
    - Scroll through the list of stations and look for the name of the stream and a nearby geographic marker.

Risk Assessment Model Reference

Risk Assessment Model is available at www.wwpinstitute.org See Treated Wood in Aquatic & Sensitive Environments, Science and Modeling Tools, Preservative Risk Assessment Model, General Risk Assessment Model Aquatic Guide – Kenneth Brooks

NOAA Fisheries Document "The Use of Treated Wood Products in Aquatic Environments"

http://swr.nmfs.noaa.gov/pdf/Treated%20Wood%20Guidelines-FINALClean_2010.pdf

DEFINITIONS

Maximum tidal current speed or Vharmonic (cm/sec). The model requires an assessment of the maximum tidal current speed in a tide cycle (V_{max}). Assuming a mixed, semidiurnal tidal regime, at least three measurements should be made three hours before and after slack tide and the six or more data averaged. Measurements should be made on an exchange to Mean Low Water (MLW). Current speeds can be measured with a number of staff mounted or weighted electromagnetic or mechanical devices. Rough estimates can be obtained by placing a plastic bottle that is ¾ full of water about two meters upcurrent from a mark on the shore (or the upstream edge of a bridge) and measuring the time required to move past a distance defined by the width of a bridge or a second mark on the shore.