

# Best Management Practices

For the use of treated wood in aquatic and wetland environments



Wood Preservation Canada  
Préservation du bois Canada



**SOUTHERN  
FOREST PRODUCTS  
ASSOCIATION**





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Developed for the United States and Canada by:

Western Wood Preservers Institute • Wood Preservation Canada • Southern Pressure Treaters' Association • Southern Forest Products Association

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*Mussels (Mytilus trossulus) and bryozoans (Phylum bryozoa)*

### **PLEASE NOTE:**

The marine organisms shown in this document represent a small subset of the 67 different invertebrate species that were identified in six inch square samples collected from treated wood piling.



## Chapter One: The Importance of BMPs

### Introduction

*Protection of the quality of water and the diversity of life forms found in lakes, streams, estuaries, bays and wetlands environments of North America is a goal and responsibility shared by everyone. An endless list of activities can impact these environments: storm waters that run off streets, exhaust from boats and cars, municipal and industry discharges, and construction of homes, docks and piers. It is everyone's responsibility to maintain the quality of our treasured resources.*

*Pressure treated wood is a building material widely used to construct piers, docks, buildings, walks and decks used in or over aquatic and wetland environments. The pressure treated wood products industry is committed to assuring its products are manufactured and installed in a responsible manner that minimizes any potential for adverse impacts to these important environments. To achieve this objective the Western Wood Preservers Institute (WWPI), Wood Preservation Canada (WPC), the Southern Pressure Treaters' Association (SPTA) and the Southern Forest Products Association (SFPA) hereafter referred to as the "Supporting Organizations", have developed and encourage the use of these BEST MANAGEMENT PRACTICES (BMPs).*

### What are the Best Management Practices?

The BMPs are recommended guidelines for the production and installation of treated wood products destined for use in aquatic and wetland environments. The guidelines were developed by the Supporting Organizations through a consensus process, based on the core philosophy of chemical minimization. Both environmental and economic concerns support the goal of placing enough preservative into a product to provide the needed level of protection while also minimizing use of the preservative above the required standard minimum in order to reduce the amount potentially available for movement into the environment.

### Specification Considerations

There are a variety of preservative systems and treated wood products approved for use in or above aquatic and wetland environments. The first step in specifying a particular treatment is to assure the preservative is approved for the intended application through the U.S. Environmental Protection Agency (U.S. EPA) and Canadian Pest Management Regulatory Agency (Canada PMRA) registration and/or review process. These government agencies establish the legal parameters for use of wood preservatives. To meet any BMP guideline a treatment must comply with these restrictions. The common goal of using the BMPs is to produce products having effective levels of protection with minimum environmental impact by minimizing the potential for migration or leaching of the preservative chemicals from the treated wood products.

The second step in specifying involves the application of the appropriate product standard from the Use Category System developed and maintained by the American Wood Protection Association [AWPA] (U.S.) or Canadian Standards Association [CSA] (Canada). These product specifications establish the minimum amount of chemical (retention) and depth of injec-



tion (penetration) that is needed to assure effective performance against decay or other wood destroying organisms. The BMPs along with the additional processing requirements are separate from and in addition to the product standards. There is a shared responsibility between the specifier and treater to assure the level of chemical application selected will meet the goal of minimizing the migration or leaching of the treating chemicals into the environment.

### **BMP Product Production Systems**

The material preparation, treatment and post treatment procedures and technologies for achieving the BMP objectives vary among preservatives and individual treating plants. A treating plant may choose to produce some or all products in compliance with production BMPs or a purchaser may specify compliance with BMPs in a particular purchase agreement. In either case compliance with production BMPs for products leaving the plant that are designated for use in aquatic or wetland environments is the responsibility of the treating firm.

It is not recommended for a specifier or regulator to designate a specific BMP treatment process for a product where more than one method of meeting a performance goal is available. It is the quality of the final product that matters, not how that end result is achieved.

**BMPs are in a state of evolution.** While this document incorporates the best available production technologies and knowledge, efforts are continuing to better understand the environmental performance of wood preservatives. In addition, periodic reviews of the treatment procedures and BMP quality assurance processes are ongoing goals to help improve the overall effectiveness of the BMPs. As knowledge and technology advance, the BMPs will be updated through amendment or at the time of the regular five-year scheduled reviews. Amendments will be posted at [WWPinstitute.org](http://WWPinstitute.org).

### **BMP Applicability**

The BMPs have been developed by the “Supporting Organizations” and are applicable to product processes and species produced in the United States and Canada.

**Added time, additional cost and sourcing constraints may result from meeting the production and quality assurance BMP guidelines; and a user or permit regulator should specifically require compliance with BMPs where it is determined there is a sufficient need or justification.** The focus of these BMPs is on uses in aquatic and wetland environments; their use is not germane for any treated wood application in a non-aquatic or wetland area.

**NOTE:** *This document is designed to serve market needs in both the U.S. and Canada even though there are some slight differences in product standards established by the American Wood Protection Association for the U.S. market and the Canadian Standards Association for Canada.*



### **BMPs Quality Assurance**

Quality oversight and inspection to assure compliance with production standards is important in any manufacturing process. For BMPs this is accomplished at two levels: Internal Quality Control at the production level; and inspection with certification by an independent third party agency. Inspection standard and protocols have been established in **Quality Assurance Inspection Procedures for Best Management Practices (BMPs) for the Use of Treated Wood in Aquatic and Wetland Environments**, included in Appendix A.

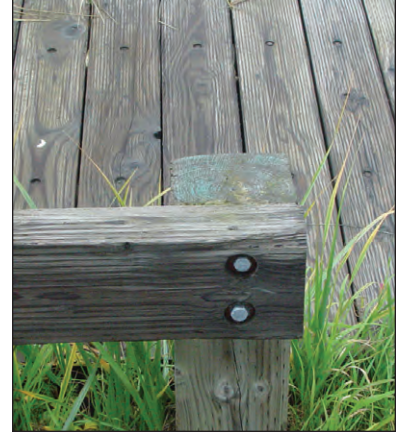
*A specification for BMPs is not complete or accurate unless it includes a requirement for independent third party inspection by an accredited agency, and certification documented by either the BMPs Mark or a letter issued by the agency certifying inspection and compliance.*

Virtually all treated wood is inspected by agencies accredited by the American Lumber Standard Committee, Inc. (ALSC). While ALSC does not accredit BMP inspection since the requirements are outside AWPA and CSA standards, those agencies accredited to inspect treated wood are most qualified to apply the BMP inspection guidelines and determine compliance. ALSC accredited agencies are the only firms accepted for the BMP Mark Program. A list of ALSC accredited treated wood agencies may be found at [www.alsc.org/contacts\\_treatedlist\\_mod.htm](http://www.alsc.org/contacts_treatedlist_mod.htm).

### **BMP User Responsibilities**

Achieving the shared goal of the BMPs cannot be accomplished unless the user of the product follows the appropriate guidelines regarding transportation, handling, inspection, storage, installation, demolition, maintenance and disposal of the product. These recommended guidelines are contained in **Chapter 4** of this document.





## Chapter Two: Guide to Selection, Specification and Quality Assurance

### Preservative Selection

A key step in designing a project in an aquatic or wetland environment is the specification of the treated wood to be used. There are a variety of available treated wood products approved for use in and/or above such environments depending upon the intended use, species, required performance and environmental conditions. The specifier should carefully consider the options in terms of required retention levels (AWPA or CSA Standard) as well as potential environmental impacts. The industry treats only with preservative chemicals registered for the specific uses by the federal, provincial or state agencies. The most common products, addressed by this document, are those treated with ACQ (Alkaline Copper Quaternary), ACZA (Ammoniacal Copper Zinc Arsenate), CA-B & CA-C (Copper Azole), CCA (Chromated Copper Arsenate), EL2 (DCOI/Imidacloprid/Stabilizer), PTI (Propiconazole Tebuconazole Imidacloprid), Creosote, Copper Naphthenate, and Penta (Pentachlorophenol).

### Performance

The purpose of treating wood products is to provide protection from wood destroying organisms or decay, thus extending the useful life and structural performance of the material. The appropriate applications of each product, the minimum penetration, and the minimum retention (amount of preservative in the **assay zone** – the zone in which wood is subject to testing) are established by the AWPA in its Use Category System and by the CSA 080 Standards, which delineate the various limitations and results of product treatment.

### Environmental and Aesthetic Considerations

In designing a project, one needs to consider the characteristics of various treated wood products in relation to the purpose of the project and the environmental characteristics of the site. Products used in a heavy industrial application will likely be different from those used in a public structure, such as a boardwalk. Similarly, the use of a moderate amount of treated wood in a fast flowing river or stream is likely to pose a minimal risk; whereas, the use of large amounts of treated wood in somewhat stagnant water may pose greater risks.

The best available science shows that pressure treated wood poses minimal risk to aquatic environments when: used in accordance with the AWPA and CSA specifications; used following the guidance provided by the appropriate required documents, such as the Consumer and Safety Information Sheets or the treated wood Material Safety Data Sheets (MSDS); the project risks are evaluated; and material produced using the BMPs.

### Help is Available

Risk assessment documents and models have been developed for the use of most preservative systems used in aquatic applications. Projects that are designed to use small volumes of treated wood immersed in and/or above water can be evaluated utilizing minimal site specific information as where projects with large volumes may require more detailed site specific information. A complete set of guide materials and peer approved risk assessment tools are available to help evaluate environmental risks, select preservatives systems and specify products are available online at [www.WWPInstitute.org](http://www.WWPInstitute.org).

## Specifying the Best Management Practices

There are three steps to assuring that products to be used in aquatic and wetland environments are produced in compliance with the BMPs.

**1. Specify the appropriate material in terms of preservative and performance as defined in the American Wood Protection Association (U.S.) or Canadian Standards Association (Canada).**

Information on properly selecting and specifying treated wood may be obtained from AWPA, WWPI, WPC, SPTA or SPPA. See the end of this chapter for website links.

**2. Specify that the material must be produced and utilized in compliance with the BMPs.**

Suggested language for inclusion in project specifications: Following the product and treatment specifications per #1 above insert:

**All treated wood products in this project shall be produced in compliance with the “Best Management Practices for the Use of Treated Wood in Aquatic and Wetland Environments” (BMPs) published by the “Supporting Organizations, November 1, 2011 or the most current version including published amendments.**

**3. Require third party independent inspection agency assurance that the products are produced in conformance with the BMPs.**

Language suggested for inclusion to project specifications. Following the specification in #2 above, insert:

**All treated wood in this project shall be certified by an independent third party inspection agency to have been produced in compliance with the BMPs.**

*Compliance will be documented by either Item A or B below:*

**A. Producers Participating in BMP Mark Program**

The presence of the BMP Mark legibly stamped, branded, marked, end tagged or an equivalent designation on each piece of material or lot arriving on site.



*Or*

In lieu of placing the BMP Mark on each piece of material or lot, a certificate of compliance issued and signed by a WWPI qualified inspection agency (see discussion of BMP Mark Program below) certifying that the material and/or its production was inspected in compliance with the “Quality Assurance Inspection Procedures for Best Management Practices for the Use of Treated Wood in Aquatic and Wetland Environments” published by the “Supporting Organizations”, November 1, 2011 or the most current version including published amendments. The BMP Mark shall be shown on the certificate of compliance.

**B. Producers Not Participating in BMP Mark Program**

A certificate of compliance issued and signed by an inspection agency certifying that the material and/or its production was inspected in compliance with the “Quality Assurance Inspection Procedures for Best Management Practices for the Use of Treated Wood in Aquatic and Wetland Environments” published by the “Supporting Organizations”, November 1, 2011 or the most current version including published amendments. An independent wood inspection agency of the producers choice and acceptable to the purchaser can be used to provide the inspection service.





## What is the BMP Mark Program?

WWPI owns and has sole rights to authorizing the use of the BMP logo. The application or display of the logo on material is authorized to producers with which WWPI has a current contract allowing its use. As a condition of the agreement, treating companies must demonstrate in writing that they have a contractual relationship with an American Lumber Standards Committee (ALSC) accredited treated wood inspection agency with which WWPI has a contractual agreement authorizing their oversight services of the use of the BMP mark under the BMP Quality Assurance Inspection program. The presence of the logo is thus a tool to show the user that the materials were produced in compliance with the BMPs; however WWPI is not an inspection agency and conducts no oversight of the treating or inspection processes per se. Any unauthorized use of the mark is subject to civil and criminal actions. A list of producers currently authorized to use the BMP Mark and the approved agencies can be found on WWPI's website at [WWPIInstitute.org](http://WWPIInstitute.org). WWPI should be notified immediately if the BMP logo is used by any organization not on the list.

A producer wanting to treat to the BMPs, but choosing not to participate in the BMP Mark Program, is not permitted to use the 'Mark' but is required to provide a certificate of compliance issued and signed by an independent treated wood inspection agency of its choice and acceptable to the purchaser.

**In addition to production guidelines, these BMPs also include guidelines that purchasers should use for installation of treated wood products. To specify full compliance with the BMPs, the specifier should provide for on-site inspection prior to installation and conformance with applicable Installation and Maintenance Guidelines found in Chapter 4.**

Suggested language for inclusion in project specifications:

*Project managers, contractors and sub-contractors on this project shall be familiar with and apply as appropriate the Installation and Maintenance Guidelines of treated wood as outlined in the "Best Management Practices for the Use of Treated Wood in Aquatic and Wetland Environments" published by the "Supporting Organizations", November 1, 2011 or the most current version including published amendments.*

Further information on uses and specifications for each preservative treatment system can be found at the following web links.

**Western Wood Preservers Institutes website:**  
[www.wwpinstitute.org](http://www.wwpinstitute.org)

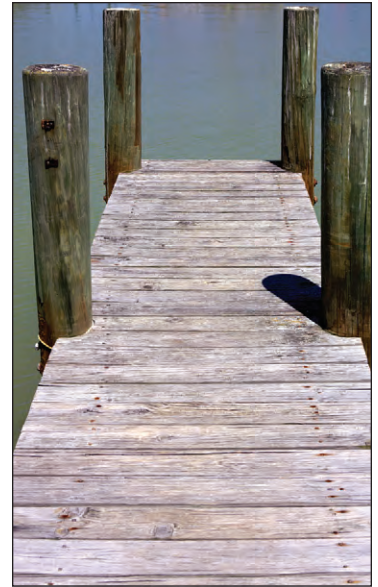
**Wood Preservation Canada website:**  
[www.woodpreservation.ca](http://www.woodpreservation.ca)

**Southern Pressure Treaters' Association website:**  
[www.spta.org](http://www.spta.org)

**Southern Forest Products Association website:**  
<http://sfpa.org>

**American Wood Protection Association website:**  
[www.awpa.com](http://www.awpa.com)

<sup>1</sup> The American Lumber Standard Committee (ALSC) which oversees the inspection of treated lumber and plywood products does not endorse, oversee or provide any quality control services in regard to BMPs and has no responsibilities regarding the program. In the BMP quality assurance procedures ALSC accreditation is used only as a tool to identify agencies which would most likely be qualified and able to perform the BMP inspection and certification services.





## Chapter Three: BMPs for the Production of Treated Wood

### **PART A:** General BMPs for the Production of Treated Wood

#### General

The following BMP procedures are applicable to the production of treated wood using all preservative systems. Additional preservative-specific BMPs are listed in Part B of this chapter. Treaters may obtain additional information in AWPA standard M20-01 (*Guidelines for Minimizing Oil-Type Wood Preservative Migration*) or may develop specific technologies based upon their unique plant facilities that meet or exceed the BMP criteria.

#### Preservatives

The preservative chemicals used to treat wood in accordance with these BMPs shall be those listed in AWPA Use Category System (UCS) Standard U1 Section 4: Standardized Preservatives and shall comply with the requirements referenced therein or as appropriately specified by the Canadian Standards Association (CSA 080).

#### Preservative Treating Solution

Specific solution requirements for each preservative listed in Standard U1 Section 4 can be found in the specific 'P' Standard referenced. Compliance with the AWPA treating solution requirements is a BMP treating criteria.

#### Plant and Product Cleaning Standards

- Follow good housekeeping practices in the plant to minimize sawdust, wood shavings, dirt and debris or residue collecting on the wood surface prior to treatment.
- The treatment cylinder (retort) should be kept clean and free of debris.
- Clean treating solutions are necessary and shall be used to produce clean products. Several process techniques have been utilized to maintain treating solutions in an acceptable condition (see individual BMPs in Chapter 3, Part B). These include, but are not limited to: filtering, turnover of tank inventory, controlling tank temperatures, using cone or dome shaped tank bottoms, minimizing storage and treating tank levels, using high quality solvents and preservatives, and periodic draining and cleaning of work tanks when residues are present.

#### Processing

- Wood products should be sorted and treated by charges containing wood of similar sizes, classes, species, species groupings, moisture content, conditioning methods, and treating characteristics and retention levels.
- Use appropriate seasoning and conditioning methods for the specified preservative treatment (i.e. air seasoning, kiln drying, steam conditioning, heating in oil, Boultonizing).
- Follow AWPA Standard T1 procedures and process limitations as appropriate for preservative and materials being treated.
- Treating should be conducted in such a manner as to seek to minimize the amount of chemical placed into the wood while assuring conformance with the AWPA retention and penetration requirements.



*Anemones (Metridium senile)*  
and a featherduster annelid  
(*Schizobranchia insignis*)

- Treat using a standard pressure process such as Bethel full cell, modified full cell, Lowry (modified empty cell) or Rueping empty cell as appropriate for preservative type and final application of treated product.
- Final vacuum time is recorded only after attaining a minimum 22 inches Hg (75 KPa) sea level equivalent and maintaining that minimum for the duration of the vacuum cycle.
- Apply appropriate post treatment conditioning techniques to minimize preservative loss after treatment. These processes are generally preservative specific with specific systems based upon plant equipment characteristics and capabilities at the treating facility. The following techniques or methods are shown as examples and are usually more applicable when treating with oil-type preservatives:
  - Transition between various phases of the treating process (e.g. pressure to final vacuum or final vacuum to atmospheric pressure) should be at a rate which allows the wood and preservative to reasonably adjust to such changes. Slow transitions generally result in a product with less surface exudations. The rate of transition varies with the size of the material being treated.
  - At the conclusion of the pressure period, and prior to removing preservative from the cylinder, the sealed cylinder should be allowed to remain sealed while the pressure in the cylinder equalizes with the treated wood. When the pressure has stabilized, a very slow release of pressure should be facilitated.
- Document the BMP treating techniques used with a permanent treating record document and maintain all records and procedures in accordance with the Quality Assurance Inspection Procedures for BMPs.

## Inspection

The following inspection guidelines are key factors in producing and providing a quality treatment and a clean BMP product.

- **Inspection** – To the degree practical material should be inspected to assure it is reasonably clean and free of dirt and sawdust prior to treatment.
- **Monitoring of Treating Solutions** – The plant operator shall inspect treating solutions and plant process filters to assure the treating solution is free of debris and meets the requirement for the specific preservative.
- **Post Treatment Visual Inspection** – A visual inspection shall be performed to verify the treated product meets the criteria specified for BMP processed material and that no excessive residues or surface deposits are present. If the criteria are not met, the product shall be rejected or reprocessed using appropriate post treatment conditioning techniques to meet the BMP surface appearance criteria.
- **Re-inspection Option** – Since the occurrence of natural variability of wood sampled in a charge or production lot is recognized, re-inspection is permitted when there is a dispute over BMP treatment conformance. This should be conducted prior to a decision for re-treatment.
- **Pre-shipment Inspection and BMP Certification** – A final visual inspection shall be conducted prior to the material leaving the treating facility to ensure the surface and treated product have no excessive residue or preservative deposits present, have not developed any excessive bleeding and to verify the presence of the BMP trademark on the material or treating certification. Any problems detected shall be corrected prior to shipment.





## Chapter Three: BMPs for the Production of Treated Wood

### **PART B: 1**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**

#### ACQ – Alkaline Copper Quaternary

#### CA-B & CA-C - Copper Azole

#### EL2 – DCOI / Imidacloprid / Stabilizer

#### PTI – Propiconazole Tebuconazole Imidacloprid

#### **Best Management Practices**

The BMPs are intended to minimize preservative migration from treated wood. In order to achieve this, the following BMP procedures, as well as the general guidelines referenced in Chapter 3, Part A, shall be followed.

#### **Post-Treating Procedures**

Select and apply appropriate post-treatment procedures to minimize preservative loss by using one of the following technologies, which may be chosen as a function of time, temperature and humidity, and must be adjusted based on the characteristics of the material and the process.

- Air Seasoning
- Kiln Drying
- Steam Conditioning
- Other Artificial Heating

#### ACQ CA-B & CA-C EL2 – DCOI PTI



#### ■ **Technical Notes**

*Specifiers and installers should follow the guidance in the Material Safety Data Sheets (MSDS) and hazard labels as required by OSHA. MSDS are available from the lumber supplier.*

*ACQ, CA-B and C, PTI and EL2 are approved to treat Douglas-fir, Hem-fir, and Southern Yellow Pine.*

*None of the listed preservatives using this BMP are recommended for salt and brackish water immersion applications. ACQ and CA-B and C are approved for Above Ground, Ground Contact and Fresh Water applications. EL2 and PTI preservatives are approved for Above Ground Use only.*

**ACZA – Ammoniacal Copper Zinc Arsenate**

**1.0 Ammoniacal Copper Zinc Arsenate (ACZA)**

ACZA is an inorganic arsenical waterborne preservative employed for industrial, commercial, agricultural and marine applications.

ACZA is used for treatment of a wide variety of species. Preservative stabilization occurs through the evolution of the ammonia, which leads to reactions between the copper, zinc, arsenic and wood.

**2.0 Best Management Practices**

BMP's are generally used for wood treated to ACZA retentions greater than 0.40 pounds per cubic foot of wood (oxide basis). They are designed to produce an acceptable level of chemical stabilization before the wood leaves the treatment facility. They, in no way mean that all metals are fixed or immobilized in the wood, but are designed to reduce the initial release of metals that can occur when treated wood is immersed in water, and also minimize surface deposits.

Following the BMP procedures referenced in Chapter 3, Part A will enhance the stabilization process and help produce wood that is free of visible surface deposits.

**3.0 Treatment Techniques**

The treatment process used to deliver the required retention to the specified depth shall be at the discretion of the treater; however, a Lowry (modified empty cell) Process is preferred because it will result in lower overall solution loadings.

Following the pressure treatment, a final vacuum of 22 inches Hg (75 KPa) shall be drawn over the wood for a minimum of time indicated below. If possible, the temperature in the retort shall be maintained at 180 to 210 F (82-99 C) during this process.



**ACZA**

	<b>Vacuum</b>	<b>Minimum Time</b>
Doug fir and other difficult-to-treat species	22 inches	2 hours
Hardwoods	22	1 hour
Pine	22	1 hour

**4.0 Post Treatment Procedures**

All ACZA BMP materials shall be processed using any one of the following procedures or a combination of the procedures. Selection shall be at the discretion of the treater.

## **PART B: 2 continued**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**

**4.1 Minimum Plant Holding Time** – Products (with treating stickers in place for sawn and plywood products) shall be held in a storage area with free air circulation for a minimum of three weeks when average ambient temperatures equal or exceed 65°F (18°C). If the ambient temperature is less than 65°F (18°C), kiln drying or another source of artificial heat may be used to achieve the minimum temperature requirement. This requirement can also be achieved by using the multiplier of degree-days (for this purpose- the sums of the mean high and low daily temperature for the days of exposure). For example; 65°F times 21 days is equal to 1365 degree-days. The corresponding time at 75°F would be 18.2 days.

**4.2 Post Treatment Kiln Drying** – Products shall be kiln dried to a maximum moisture content of 30%.in the AWPA assay zone of outer ½ inch by employing a kiln cycle of 120°F - 160°F (50°C - 70°C) dry bulb temperature. The cycle should not exceed 160°F dry bulb anytime during the cycle.

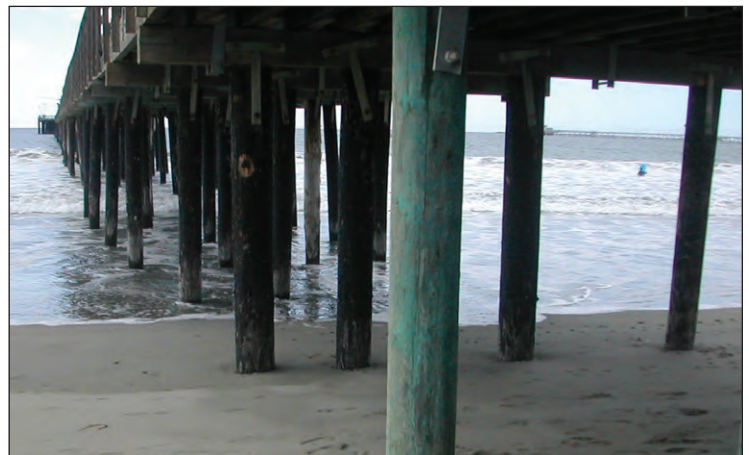
**4.3 In-Retort Ammonia Removal Plus Plant Holding Time** - After the final vacuum period with heat, the retort door shall be opened and ambient air drawn through the treated wood charge from the door to the rear of the retort, vented to a scrubber at a minimum rate of 250 cfm (7.08 m3/minute) for a period of three hours. The material is then handled in the same manner as under “minimum plant holding time” in Section 4.1 except the minimum holding time is one week at the specified average temperatures.

*NOTE: As an option to the one week holding time, the material may also be placed into a separate closed conditioning vessel in order to draw the ambient air with appropriate vacuum and time to remove the ammonia vapors.*

**4.4 Aqua-Ammonia Steaming Cycle** – Following the normal post-pressure period vacuum to draw excess preservative solution from the wood, the material is subjected to a post treatment steam-conditioning process. The heating coils are covered with a minimum 2% solution of ammonia in water, which is heated for about 3 hours. A minimum temperature of 190°F - 200°F (88°C - 93°C) shall be maintained for at least 1.5 hours. The heating process is followed by a final vacuum of 2 hours, then an hour of drawing fresh ambient air through the retort to remove excess ammonia vapors and to cool the surface of the material. Material will then be processed with a minimum one-week plant holding time at the average temperature requirements as stated in Section 4.1.

### **5.0 Plant Records**

Section 5 of Appendix A states, “Product compliance with the requirements of the applicable BMP’s is the responsibility of the Treater until the BMP process is validated as complete and material is shipped from the plant to Customer. The plant shall maintain records to validate that the times, temperatures and other factors were appropriate for the method selected to meet the BMP. The treater assumes this responsibility by placing the BMP mark or stamp on the material or with a certification of the BMP when it is shipped from the plant.



■ **Technical Notes**

Specifiers and installers should follow the guidance in the ACZA treated wood Material Safety Data Sheets (MSDS) as required by OSHA.

*Because of its ability to treat the refractory Douglas fir heartwood to meet the AWPA penetration and retention standards, ACZA is most prevalent on the West coast for use in industrial product treatment of timbers, commercial decking for walkways and bridges or piling used in all aquatic environment applications.*

*Chemical stabilization is the term applied to the chemical reaction in which the active ingredients of a waterborne treating solution undergo a series of reactions with themselves and the wood that make them resistant to migration. This process also increases the durability of the product. A key to the treating process for ACZA is the presence of ammonia, which facilitates carrying the active ingredients into the cell structure of the wood during treatment. Evaporation and removal of the ammonia following treatment is critical for the remaining ingredients to become stabilized, thereby minimizing the opportunity for leaching from the product in its end use. The BMP procedures are designed to accelerate the removal of ammonia and aid in the completion of the stabilization of the chemicals in the wood where it provides lasting protection from the wood destroying organisms in service.*

*At the time of the revisions to this document there were no approved test methods or standards developed to accurately define the level of chemical stabilization in ACZA. This is being studied and when an acceptable test is established it will be incorporated into the ACZA BMP.*

*Plant records shall have the data and information used to validate the selected process meeting the particular BMP method being used be it times, temperatures or other factors used to meet the requirements for BMP. The treater assumes this responsibility by placing the BMP mark or stamp on the material or with a certification of the BMP so when it is shipped from the plant it is certified by the shipment that it meets the BMP requirements.*



## **PART B: 3**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**



## **CCA – Chromated Copper Arsenate**

### **Best Management Practices**

The BMPs for CCA are designed to minimize preservative migration from CCA treated wood. The following BMP, as well as the general guidelines referenced in Chapter 3, Part A, shall be utilized.

### **Treating Procedures**

Full Cell (Bethel) Pressure Treatment is recommended for most western species. Modified Full Cell procedures should be limited to sapwood species, e.g., southern yellow pine. Preservative solution quality should be closely monitored.

### **Post Treating Procedures**

Apply appropriate post treatment procedures to maximize preservative fixation by using one of the following technologies, which may be chosen as a function of time, temperature and humidity, and must be adjusted based on the characteristics of the material and the process.

- Air Seasoning
- Kiln Drying
- Steam Conditioning
- Hot Water Bath

The best available technology for confirming fixation in CCA treated material is the Chromotropic Acid Test (AWPA Standard A3-11, Method for Determination of the Presence of Hexavalent Chromium in Treated Wood, [1995]). If testing shows that fixation has not been achieved according to the Chromotropic Acid Test, the material should not be shipped until fixation according to the Chromotropic Acid Test is confirmed.

### **■ Technical Notes**

*Specifiers and installers should follow the guidance in the CCA treated wood Material Safety Data Sheets (MSDS) and hazard labels as required by OSHA and use the product in conformance with the Consumer Safety Information Sheet for Inorganic Arsenical Pressure Treated Wood and product labeling.*

*CCA is considered an excellent treatment for most softwood species. Achieving the required penetrations in Douglas-fir may be extremely difficult. CCA is not recommended for Douglas-fir marine piling (except as the first treatment in “dual treatment”) or for treatment of interior Douglas-fir.*





## **PART B: 3 continued**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**

*FIXATION — In the CCA treating process, water is the carrier to move the metals or active ingredients into the wood where they become fixed to the wood. Once the chemical reaction called “fixation” occurs, the potential for migration of active ingredients is minimized.*

*While a complex reaction, fixation which is a function of temperature and time essentially involves the reduction of the hexavalent chromium to trivalent chromium with the formation of a complex mixture of insoluble chromates. In the process, insoluble arsenates of copper and chromium are also precipitated in the treated wood.*

*Chromic acid or Chromium VI is the component in the CCA process which is the basis for the Chromotropic Acid test. The procedure can detect Chromium VI at concentrations as low as 15 parts per million. Material passing the test (i.e., no detection of Chromium VI) for use in aquatic environments will be 99.5 to 99.95% fixed. The Chromotropic Acid test is a rigid qualitative procedure specifically for CCA treated wood.*

*FIXATION PERIOD – The following post-treatment processing limits have been found to significantly enhance preservative fixation while also avoiding conditions which would cause losses in mechanical properties.*

*The time-temperature limitations specified below are appropriate for all species and can be found in the appropriate AWWA Specification.*

*a. Hot Water Bath (Liquid Fixation Processes), Maximum Temperature: 220°F (105°C) Duration: Until the outer 0-0.5 inches (0-12mm) portion in 4 out of 5 borings per charge pass the Chromotropic acid test (AWWA Standard A3, Method 11). In using this post-treatment procedure do not exceed the maximum time-temperature combination listed below.*

*Temperature/Time:*

- 220°F (105°C) 6 hr.
- 203°F (95°C) 9 hr.
- 185°F (85°C) 12 hr.
- 167°F (75°C) 18 hr.
- 149°F (65°C) 24 hr.

*b. Air and or Kiln Drying Processes, Maximum Dry-bulb Temperature: 160°F (70°C), Maximum wet-bulb Depression Temperature: 20°F (10°C) until the outer 0-0.5 inches (0-12mm) portion in 4 out of 5 borings per charge pass the Chromotropic acid test (AWWA Standard A3, Method 11).*

*c. Steaming Processes, Maximum Temperature: 220°F (105°C) Duration: Until the outer 0-0.5 inches (0-12mm) portion in 4 out of 5 borings per charge pass the Chromotropic acid test (AWWA Standard A3, Method 11). Do not to exceed the maximum time-temperature combination listed below.*

*Temperature/Time:*

- 220°F (105°C) 6 hr.
- 203°F (95°C) 9 hr.
- 185°F (85°C) 12 hr.
- 167°F (75°C) 18 hr.
- 149°F (65°C) 24 hr.



## **PART B: 4**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**



### Copper Naphthenate

#### **Best Management Practices**

The BMPs for Copper Naphthenate are designed to assure a clean product and minimize the potential for chemicals to enter the environment. In order to minimize the amount of Copper Naphthenate material available to migrate into the environment, the following guidelines, as well as the general guidelines referenced in **Chapter 3, Part A**, shall be used when treating material for use in aquatic, above water, or other wetland applications:

#### **Treating Techniques**

- Air drying or kiln drying wood prior to treatment may improve the surface appearance (dryness) of the wood after treatment. Accumulated moisture is also more easily removed from preservative solutions when treating kiln-dried or air-seasoned wood.
- The empty-cell process should always be used for full-length pressure treatment with oil-borne preservatives if it will provide the desired retention. Either the Rueping process (empty-cell with initial air) or the Lowry process (empty-cell without initial air) can be used.
- Full length and butt thermal treatment of naturally durable species such as Western Red Cedar for poles can also be used to minimize the potential for chemicals to enter the environment.
- Following treatment using an empty-cell process a minimum final vacuum of 22 inches Hg (-75 KPa) sea level equivalent shall be applied for a minimum of two hours. If possible, the retort should be heated between 180°F and 210°F (82°C – 99°C) during the vacuum process.

#### **Treating Procedures**

- Solution Filtration The Copper Naphthenate solution in use shall be filtered regularly or otherwise kept clean to remove solids, which may otherwise be deposited on the wood during treating.
- Any accumulation of moisture in the preservative work tank should be drained off prior to treatment.



### Copper Naphthenate

### **Post Treating Procedures – Oil Carrier**

For Copper Naphthenate treated products with an oil carrier to be used in aquatic or wetland environments or where bleeding of preservative is objectionable, use one of the following BMPs:

- **Expansion Bath** This process increases the temperature of the preservative solution surrounding the wood for the purpose of recovering excess preservative and improves surface cleanliness of the product. Follow the general procedures described in AWWA UCS Standard T1-10, section 2.7. Use a minimum expansion bath of one hour. The maximum temperature of the expansion bath shall be 220°F or 230°F (104°C to 110°C) depending on the specific commodity standard limitations. The expansion bath shall be followed by a vacuum period using a minimum of 22" of Hg (-75 kPa) for a minimum of two hours.
- **Final Steaming** Following the pressure period and once the Copper Naphthenate has been pumped back to the storage tank, a vacuum shall be applied for a one-hour minimum at not less than 22" of Hg (-75 kPa) of vacuum to recover excess preservative. Following the vacuum period, the wood shall be subjected to steaming for a two-hour time period for lumber and timbers and three hours for piling per the limitations of the AWWA Commodity Standards. The minimum temperature during steaming shall be 200°F (93°C) and the maximum shall be 240°F to 245°F (116°C to 118°C) depending on the species being treated. After steaming, apply a final vacuum for a minimum of four hours at 22" of Hg (-75 kPa) of vacuum.
- **Extended vacuum cycle** This technique involves the use of extended vacuum cycle time or double vacuum cycles where a second vacuum is pulled after allowing the retort to equalize to atmospheric pressure following the "break" from the first vacuum cycle. Preservative collected in the cylinder during the first vacuum cycle should be pumped to the work tank before initiating the second vacuum cycle.

Additional treating information to minimize environmental exposure of oil-type wood preservatives in pressure treated wood can be found in AWWA Standard M20-01, or latest revision.

### **Post Treating Procedures – "Light" Solvent Carrier**

For Copper Naphthenate treated products with a light solvent carrier, such as AWWA Standard P9, Type "C" solvent for aquatic or wetland applications, use the following BMP:

- A final vacuum shall be used for a minimum of 1 hour at a minimum of 22" of Hg (-75 kPa) of vacuum.

Additional treating information to minimize environmental exposure of oil-type wood preservatives in pressure treated wood can be found in AWWA Standard M20-01, or latest revision.

## **PART B: 5**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**

## **Creosote**

### **Best Management Practices**

The BMPs for Creosote are intended to minimize the amount of preservative material available for migration into the environment. The following guidelines, as well as the general guidelines referenced in Chapter 3, Part A, shall be used when treating material for use in aquatic, wetland or marine applications:



### **Treating Procedures**

- Follow recommendations in AWWA M20-01 (or most recent publication) Standard providing Guidelines for Minimizing Oil-Type Wood Preservation Migration as appropriate for Creosote P1/P13 and product treated for aquatic or wetland exposure.
- Treat using preservative specified in AWWA Standard P1/P13, "Standard for Coal Tar Creosote for Land and Fresh Water and Marine (Coastal Water) Use."
- The "in use" Creosote inventory maintained by the treating firm at the plant for BMP - treated applications shall be purchased, managed and/or processed such as to maintain a xylene insoluble (XI) of 0.5% maximum and to maintain moisture content within specifications. (Exception -- A xylene insoluble (XI) level of 1.5% will be allowed for facilities treating Ponderosa or Southern Pine due to the higher level of extractable sap and resins associated with these species).
- Techniques shall be incorporated into the treating process to minimize the amount of residual Creosote, which may occur on the surface of the treated product. (Techniques may vary depending upon the product type and wood species).
- On Southern Pine, if plant equipment allows, steam conditioning is an alternative to conditioning by kiln drying. Steam conditioning may result in energy savings by shortening post treatment cycles while producing desired cleanliness and dryness.

## **Creosote**



## Post Treating Procedures

Prior to shipment, material for aquatic applications shall be processed under one of the following procedures as determined by the producer:

- **Expansion Bath** -- Following the pressure period the Creosote should be heated 10°F to 20°F (6°C to 11°C) above press temperatures (following the preservative and species temperature limitations set by AWWPA) for a minimum of one hour. Pump Creosote back to storage and apply a minimum vacuum of 24 inches of Hg (610 KPa) for a minimum of 2 hours.

- **Steaming** — Following the pressure period and once the Creosote has been pumped back to the storage tank, a vacuum shall be applied for a minimum of two hours at not less than 22 inches of Hg (560 KPa) of vacuum to recover excess preservative. Release vacuum back to atmospheric pressure and steam for a two-hour time period for lumber and timbers and three hours for piling. Maximum temperature during this process shall not exceed 240°F (115.5°C). Apply a second vacuum for a minimum of four hours at 22 inches of Hg (560 KPa) of vacuum.

- **Vacuuming** --- Following the pressure period and once the Creosote has been pumped back to the work tank, a vacuum shall be applied for a minimum of one and half hours at not less than 22 inches of Hg (560 KPa) of vacuum to recover excess preservative. Then, depending on plant equipment: 1.) vacuum for a minimum of one and half hours at not less than 22 inches of Hg (560 KPa) or 2.) steam material for one-hour minimum and then pull not less than 22 inches of Hg (560 KPa) vacuum for a minimum of one and half hours. Maximum temperature during steaming shall not exceed 240°F (115.5°C).



*Mussels (Mytilus trossulus)*

### ■ **Technical Notes**

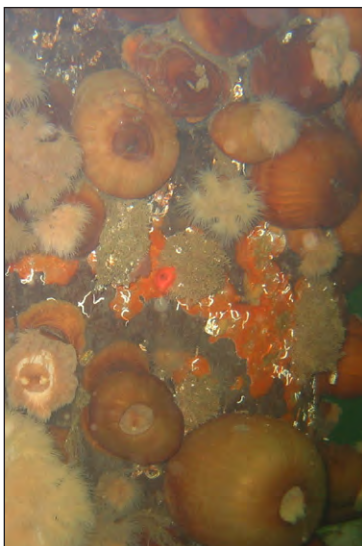
*The purpose of the BMP for Creosote is to minimize the amount of surface residues which are available to migrate to the environment. The purchase of low xylene new Creosote and management processes to maintain low XI levels will assure that there are a minimum of contaminants on the surface of the finished product. The post conditioning requirements (e.g. steaming or expansion bath and vacuuming) help to assure that excess Creosote is removed from the product while maintaining the required amount in the assay zone to meet the product specification after treatment. Surface Sheen — when driving Creosote piling, visible oil sheen will often develop on the water surface. This sheen represents only a trace quantity of Creosote preservative and in most all instances it will dissipate within 24-48 hours through biodegradation, evaporation or oxidation of the Creosote. Available data indicates this sheen, which decreases rapidly following installation, will not harm aquatic life nor will it enter the food chain.*

*Specifiers and installers should follow the guidance in the Creosote treated wood Material Safety Data Sheets (MSDS) and hazard labels as required by OSHA and use the material in conformance with the Consumer Information Sheet for Creosote pressure treated wood. Creosote should not be used in those portions of projects subject to frequent public contact, i.e., hand-rails, sunbathing decks, etc.*



## **PART B: 6**

### **BMPs for Specific Preservatives Used in the Production of Treated Wood**



*Colonies of plumose anemones (Metridium senile), tubeworms (Spirobidis) and coralline algae (Lithothamnium)*

### **Dual Treated Marine Piling**

#### **Best Management Practices**

The BMPs for Dual Treating requires that individual BMPs for each preservative be specified for the treatment unless the same objectives can be obtained through a combined practice. In addition to the individual BMPs for each preservative specified, the general guidelines referenced in Chapter 3, Part A shall also be utilized.

Dual treatment is generally only specified on the Pacific coast in coastal areas south of San Francisco, California, the Atlantic coast between New Jersey and Florida, and along the Gulf Coast.

#### **Treating Procedures**

- Refer to the BMP for the waterborne preservative being specified and for Creosote.
- Techniques shall be incorporated into the Creosote treating process to minimize the amount of residual Creosote, which may occur on the surface of the dual treated product. Techniques will vary depending on experience, equipment, product type and wood species.

#### **Post-Treating Procedures**

After initial treatment but prior to the second treatment, follow the post treating procedures for the waterborne preservative specified.

Prior to shipment but after the second treatment with Creosote, the material shall be processed under the following procedure by the producer:

- Vacuuming – Following the pressure period and once the Creosote has been pumped back to the work tank, a vacuum shall be applied for a minimum of three hours at not less than 22 inches of Hg (560 KPa)\* of vacuum to recover excess preservative and dry the material surface.

\* Adjusted for geographic elevation location.

### **Dual Treated Marine Piling**



## Pentachlorophenol (Penta)

### Best Management Practices

The BMPs for Penta are to ensure responsible treatment and product use. Its use in marine projects should be limited to above the splash zone because Penta does not protect against marine organisms. In order to minimize the amount of Penta material available to migrate into any environment during its use, the following guidelines, as well as the general guidelines referenced in **Chapter 3 Part A**, are recommended when treating material for these applications. Following these procedures should result in a clean and dry treated wood product:

### Treating Procedures

Manage the treating plant's "in-use" Penta by continuous filtration or other available methods to maintain the solution with minimum particulate matter. Such processes will result in less surface deposits, minimizing the amount of material which may be released from in-service wood.

### Post Treating Procedures

- **Surface treatment** – Following the pressure period, incorporate one of the following procedures into the treating process to minimize the amount of residual treating solution which may occur on the treated product surface. Techniques may vary depending upon the product type and wood species.
- **Steaming** – Material may be cleaned by final steaming within the limits specified for that commodity in AWWA, T-1 - Section 8.
- **Expansion Bath** –When final steaming is not utilized the treater may use an expansion bath. Perform this expansion bath in accordance with AWWA T1, Section 2. This generally involves heating the preservative 10 F to 20 F (-12.22 C to -6.67 C) above pressure temperatures for a minimum of one hour, followed by pumping the preservative back to storage and applying a minimum vacuum of 22 inches (55.88 centimeters) for a minimum of two hours.
- **Extended vacuum cycle time** – This technique involves the use of extended vacuum cycle time or double vacuum cycles where a second vacuum is pulled after allowing the retort to equalize to atmospheric pressure following the "break" from the first vacuum cycle.
- Preservative collected in the cylinder during the first vacuum should be pumped to the work tank before initiating the second vacuum.

Before removal of material from the treating area, the treater should verify the material is free of surface deposits and/or drippage of excess preservative. Drippage is generally the result of product continuing to adjust to ambient conditions of temperature and pressure.

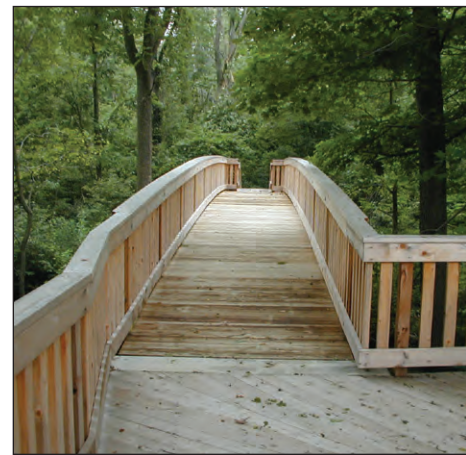
### ■ *Technical Notes*

*Surface Sheen* – Occasionally when installing Penta treated wood in or over water, a visible oil carrier sheen may develop on the water surface. This sheen contains a negligible quantity of Penta as there is generally less than 1% Penta in Penta treated wood. In nearly all instances this sheen will cease in less than 24 hours through bio and photodegradation. Available data indicates that this sheen does not represent any harm to aquatic life nor will it enter the food chain. It is basically an aesthetic concern which decreases rapidly following installation

*Steaming* -- Steaming may produce contaminated process water requiring waste water treatment before discharge to meet local, state or federal regulations. Consult AWWA Treatment Standards to determine if this procedure is allowable, and for the duration and temperature limitations.

*Pentachlorophenol treated wood is not recommended for salt and brackish water immersion applications.*

## Pentachlorophenol (PENTA)





## Chapter Four: Installation and Maintenance Guidelines

Achieving the goals of the Best Management Practices can only be fully achieved if the users of the products are also engaged. The following guidelines are suggested practices, but other applicable practices may be determined by the specifier or project managers.

### Design and Purchasing

It is recommended that any order for the purchase of treated wood materials should involve communication between the purchaser/specifier and the seller or treating company whichever is most practicable or customary, and that the order, including the environmental concerns with the project, should be reviewed in detail with the producer.

- Projects should be designed and specified to provide for the maximum amount of cutting, prefabrication and framing prior to treatment. This allows for better treatment of product and minimizes the need for field cutting and treatment.
- Where treated wood may be subject to continual abrasion, such as floating docks against piling, the project should incorporate design features to prevent the ongoing contact. This will increase the life of the project and minimize treated material entering the environment.

### Transportation

- When additional protection from precipitation is desired or warranted it is recommended preservative-treated sawn wood material be top wrapped or covered while being transported to its designated location.
- Care should be taken during the loading and unloading of the preservative-treated wood to prevent or minimize damage to the product that causes untreated areas to be exposed. If untreated areas become exposed by damage they should be field treated with an approved preservative (copper naphthenate) as per AWPA Standard M4.

### Inspection, Acceptance, Rejection

- As soon as practical after receipt, the material and the accompanying paper work, should be inspected to assure it has been treated to specified AWPA standards and certified to have been treated under the BMP program by either the presence of a BMP mark with a legible stamp, brand, mark, end tag or equivalent designation on the material or by a letter of certification from an independent third party inspection agency. If any problems exist, the supplier should be contacted immediately.
- BMP materials should be inspected to assure they are reasonably free of surface debris and excess surface chemical. Material treated with oil type preservatives should be examined for signs of preservative migration, and excessive residues or bleeding.
- Where the products are of concern they should be rejected from installation and the treating company should be contacted immediately for corrective action.





## Storage

- **Onsite** – The material should be stored away from the water until it is needed for installation. When preservative-treated wood is stored on the jobsite for an extended period and/or there is a threat of the material being exposed to precipitation, it is recommended the material be stacked above the ground. The area where the material is to be stacked should be free of debris, weeds and dry vegetation and should have adequate drainage to prevent the material from being subjected to standing water. Also, if warranted, all stacked material designated to be removed from service should be covered for disposal and material designated for use should remain covered until used.

- **Offsite** - In situations where preservative-treated wood material is being inventoried prior to distribution to the jobsite or when material removed from service is taken to a storage site prior to its disposal or reuse, it should be stacked in a well-drained area free from debris, weeds and dry vegetation above the ground on bunks or pallets. The stacked material may be stored under a covered area or top wrapped with a tarp to minimize exposure to precipitation.

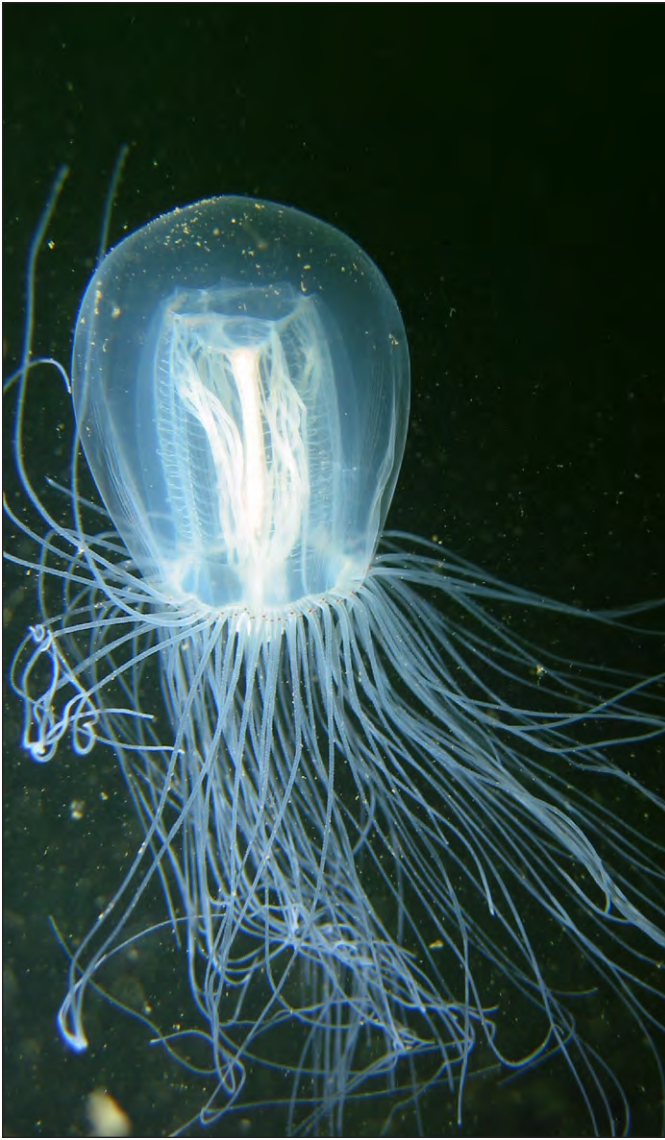
## Field Treating Guidelines

Copper Naphthenate based solutions are commonly used in field treating of holes, cuts or injuries, which occur to the treated product. The objective of field treatment is to assure complete product treatment.

The following guidelines should be followed in field treating projects in aquatic or wetland environments:

- Follow the procedures outlined in AWPA Standard M4, Standard for the Care of Preservative-Treated Wood Products.
- When field treating by brushing, spraying, dipping or soaking do so in such a manner that the preservative does not drip or spill into the environment.
- Whenever possible, apply field treatments prior to assembling the structure over the body of water or wetland environment.
- Conduct the application of the preservative so that any overspray or drippage of preservative can be recovered or retained.
- Specifiers and installers should follow the directions for use on the Copper Naphthenate based end cut solution label and Material Safety Data Sheets (MSDS) for the product.





Jellyfish (*Aglantha digitale*)

### Installation

- When field cutting, drilling or fabrication is necessary, it should be done away from the water or wetland area to the degree practical and all waste, including sawdust, should be collected and disposed of appropriately. (See Disposal below). There are many approaches to ensuring that the debris from field fabrication and maintenance activity is properly collected and removed, but the choice will depend on the situation and the construction or maintenance crew. It is recommended in most cases that fabrication be done at specific cutting stations in order to consolidate the collection of debris. The use of a tarp is suggested for collecting sawdust from circular saws and chainsaws, and plastic tubs or similar containers are suggested for collecting debris created from drilling holes on-site. The importance of collecting debris from construction and maintenance activities should be stressed in planning and budgeting for projects so that the crews clearly understand that debris collection is an integral part of the construction and maintenance process in order to minimize the release of preservative into the environment.

- Installation of oil borne type preserved products may initially result briefly in a thin oily sheen on the water surface. Such sheens are generally of an aesthetic rather than biological concern and will dissipate in a relatively short period of time. Absorbent booms or barriers can be used to control and collect the sheens.

### Demolition

The removal of existing treated wood structures from aquatic and wetland environments should be done with care to minimize the potential for treated debris to enter the environment. The guidelines used in construction of new projects should be applied to demolition wherever applicable and the added effort should be considered in costing the project.

- Wherever practical the treated wood structure or as large a portion as practical should be removed well away from the area for final demolition.
- All scraps and sawdust from the demolition should be collected and removed for appropriate disposal. In aquatic applications absorbent booms should be considered if needed to control drift of scrap materials from the work area or to control sheens which may develop with the disturbance.
- Piling - If not otherwise specified by the regulatory permit or project plan, treated wood piling may be: 1) left in place; 2) pulled and moved off site; 3) cut off at the mud line; 4) cut off below the mud line and capped with clean material.
- Salvage and Reuse - Depending upon the condition of the treated wood materials removed, the product may retain enough of the structural and preservative characteristics to make it suitable for reuse in a manner compatible with its original purpose. Common secondary applications include use as posts, landscape timbers and retaining walls. Distribution of such materials to the market, through sale or donation, should be done with great care to assure the structural and treatment integrity of the product and to assure that the new user is provided information on the use of the material including applicable EPA-approved Consumer Information or Safety Information Sheets. Note: It is extremely difficult to detect internal degradation in any materials intended for reuse and it may be prudent to avoid the use of salvaged marine piling in foundation piling or structural applications.

## Disposal

Treated wood scraps and sawdust as well as material for disposal that is not reused must be disposed of appropriately in a timely manner. The disposer should check with local authorities that have jurisdiction over this process to assure disposal is accomplished in compliance with all applicable requirements, which may supersede the following guidelines.

For a detailed discussion of Federal and State requirements see “Disposal of Treated Wood” at [WWPIInstitute.org](http://WWPIInstitute.org).

- NEVER BURN TREATED WOOD IN OPEN FIRES OR FIREPLACES!
- Do not use treated wood as mulch.
- Do not leave the waste material on site or in stockpiles for extended time periods.
- Under federal regulations treated wood waste is classed or managed as a non-hazardous material and may be disposed of at municipal landfills approved to receive such material by state, provincial and local authorities.
- A few state or provincial governments have more stringent requirements for classification of wastes. However, in such cases the issue of treated wood has been addressed in law and/or regulations allowing for disposal in approved municipal landfills. For specifics, local state and provincial authorities should be contacted.
- There are various incinerators, waste-to-energy burners and industrial furnaces across the country, which are approved and permitted for utilization of creosote and pentachlorophenol treated wood waste.



*Graceful crabs (*Cancer gracilis*)  
in a mating grasp*



## Appendix A: Quality Assurance Inspection Procedures for Best Management Practices (BMPs) for the Use of Treated Wood in Aquatic and Wetland Environments

*Unless otherwise defined, all terms and definitions in these procedures shall be as found in the American Wood Preserver's Association (AWPA) Book of Standards.*

### 1. SCOPE

These Quality Control and Inspection Procedures are applicable to all pressure treated wood products produced under the BMPs for use in, above or in the vicinity of aquatic and wetland environments and are supplemental to the requirements of AWPA and/or other product specifications. Inspection in regard to product specification or treating standards is separate and in addition to the BMP inspection requirements.

Producers that choose to treat to the BMPs, **but choose not to participate** in the WWPI BMP Mark Program are not permitted to use the 'Mark', as described in Paragraph 2.2 of this document, but will be required to provide a **certificate of compliance** issued and signed by an independent treated wood inspection agency of its choice and acceptable to the purchaser for each lot.

### 2. DEFINITIONS

#### 2.1 BMPs

Best Management Practices, published parameters developed for use in specifying and producing material for use in aquatic and wetland projects in the United States and Canada. The BMPs were developed and published by the Western Wood Preservers Institute (WWPI), Wood Preservation Canada (WPC), Southern Pressure Treaters' Association (SPTA) and the Southern Forest Products Association (SFPA).

#### 2.2 BMP Quality Mark

2.2.1 A mark registered under the Federal Trade Marks Act, as indicating certification of conformance to pressure treated processing and pressure treated product rules. A mark which when stamped or affixed to wood products, certifies that all the actions and quality certification requirements under these Quality Assurance Inspection Procedures have been met by both the treater and the Quality Control Agency which licenses the use of the mark by pressure treating plants.

2.2.2 A register protected logo which, when included with the "MARK", denotes compliance to the BMPs:



This mark remains the property of WWPI and shall only be used by authorized agencies and producers.



### 2.3 Quality Control Agency

An organization that either (1) is acknowledged by WWPI as authorized under the BMP Mark Program; or (2) designated acceptable by agreement between the purchaser and producer to issue a certificate of compliance for lots, to audit, by testing and sampling, the quality marked or certified BMP products treated in accordance with these Quality Assurance Inspection Procedures to assure conformance.

The Quality Control Agency shall have no financial interest in any company producing any portion of the products inspected and tested. The Quality Control Agency shall not be owned, operated or controlled by any such company.

### 2.4 Residence Quality Supervisor (RQS)

An individual designated by the treater and approved by the Quality Control Agency who performs the functions and meets the requirements of Paragraph 3.1.2. The Quality Control Agency shall initially and continuously thereafter determine that the Resident Quality Supervisor can demonstrate satisfactory knowledge of all manufacturing, sampling and testing requirements.

### 2.5 Seller

As used in these Quality Assurance Inspection Procedures, a seller is each owner of the products described by the Quality Assurance Inspection Procedures beginning with the treater and including intermediate sellers between manufacture and use.

### 2.6 Purchaser/User

Entities, individuals or representatives who are responsible for the acquisition and installation of BMP treated wood products.

### 2.7 Treater

A company or firm engaged in the treatment of the products covered by these Quality Assurance Inspection Procedures.

### 2.8 Lot and Lot Inspection

A lot for inspection at plants will be a single charge or a shipment, whichever is less. A lot for inspection at plant storage yards, at sales yards, in transit, or at jobsites will be that material available at the time and place of inspection which contains products from only one treating plant and will contain only one species or species group and one preservative treatment.

### 2.9 Suspended for Cause

Suspension of production is required by an agency when it determines that a continuous non-conformance in treating to BMPs has been identified.

## 3 REQUIREMENTS

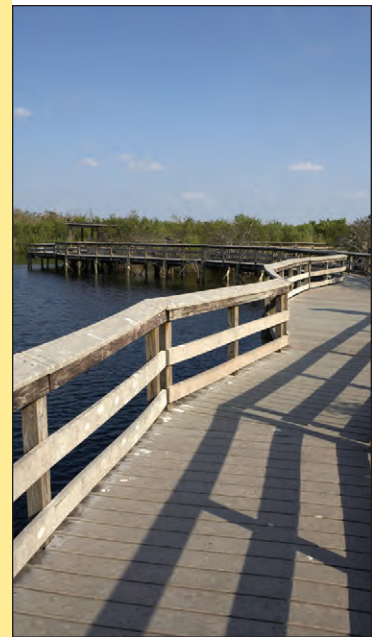
### 3.1 Quality Control

Products conforming to this procedure shall be produced under a system of quality control with the following requirements:

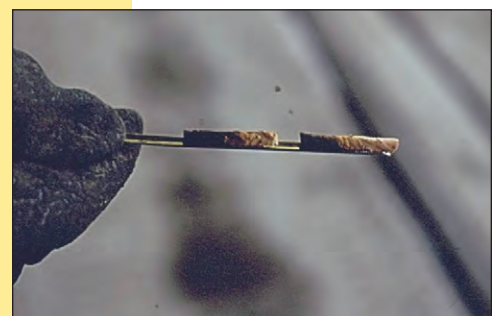
#### 3.1.1 Treating Equipment and Records

The following are both initial and continuing minimum treating plant equipment and record requirements. The Quality Control Agency shall initially and continuously thereafter determine that the manufacturing equipment meets the minimum requirements described in these Quality Assurance Inspection Procedures. Procedures:

- (a) An effective operating system or procedure to remove residuals and debris from preservative solutions.
- (b) Facilities at either the plant or at a central laboratory for making all BMP test requirements.
- (c) 1. An operating system of BMP record keeping which shall include records of consecutively numbered treating charges showing the basic data required in AWPA Standards M2, including the volume of wood, solution concentration, gallons absorbed, and the results of the inspection of each completed charge. Records shall be retained for one year after shipment.



Core samples are removed by a hollow drill bit called an increment borer.



Lumber under five inches thick requires a minimum of 0.40 inch penetration; lumber over five inches thick requires a minimum of 0.50 inch penetration.



2. Track and code all post treatment processes and testing to assure compliance with BMPs.

3. A statement of compliance will be attached to each program treating charge report stating conformance to BMPs.

4. A copy of the treating record and RQS report shall also be kept in a separate file and available to the quality control agency during normal working hours.

- (d) An internal quality control program maintained by systematically checking treated wood for conformance to these Quality Assurance Inspection Procedures, and applicable AWPA Commodity Standards.

### 3.1.2 Resident Quality Supervisor (RQS)

An individual shall be appointed by the treater and approved by the Quality Control Agency to oversee and/or perform plant quality control and:

- (a) Shall be responsible for conformance of all quality marked or certified products to the requirements of these Quality Assurance Inspection Procedures.
- (b) Must understand all requirements of these Quality Assurance Inspection Procedures and be able to recognize these requirements in each class of material produced.
- (c) Must understand the capabilities of the treating equipment and procedures in use and be able to judge its proper function in achieving the BMPs.
- (d) Shall have authority to stop any operation found to be causing non-conformance attributes.
- (e) Shall have authority to correct any operation found to be causing non-conforming attributes.
- (f) Must determine that all requirements contained in these Quality Assurance Inspection Procedures are continuously met by reviewing treatment records and performing any and all necessary tests prescribed.
- (g) Record findings certifying compliance and attach a copy to the treating records.
- (h) Notify the Quality Control Agency of the availability of BMP material for review.

### 3.1.3 Quality Control Agency Duties

Quality Control Agency described in Paragraph 2.3 shall check and approve the plant equipment, Resident Quality Supervisor and the first five charges and shall thereafter perform continued checking and testing as specified by these quality Assurance Inspection Procedures:

- (a) Initially and continually thereafter, determine that procedures and requirements of these Quality Assurance Inspection Procedures are being adhered to by the Treater.
- (b) Review plant quality control records noting any deficiencies.
- (c) Check plant equipment for compliance with Paragraph 3.1.1 at least once each six months.
- (d) Perform the sampling and testing required by WWPI's BMPs at a ratio of 1:10 BMP charges produced or portion thereof.
- (e) Generate a report of findings to be reviewed with RQS.

### 3.1.4 Compliance Documentation for Producers Participating in BMP Mark Program

- (a) The presence of the BMP Mark legibly stamped, branded, marked, end tagged or otherwise on each piece of material or lot or;
- (b) A certificate of compliance for each lot as defined in Paragraph 2.8.

### 3.1.5 Compliance Documentation for Producers Not Participating in BMP Mark Program

- (a) A certificate of compliance for each lot as defined in Paragraph 2.8.

### 3.1.6 Non-conformance

If a product non-conformance is found by the Quality Control Agency or the Treater, at either a point under the Treater's jurisdiction or at a location not under his jurisdiction, the Treater will correct the non-conformance or remove the Quality Mark under the supervision of the Quality Control Agency. The Treater should be afforded every opportunity to correct non-conformance. Where applicable, material may be re-treated, and all re-treatment shall be in accordance with the appropriate AWPA Standards and these Procedures. If the lot fails to conform after re-treatment, the Quality Mark shall be removed from all pieces in the non-conforming lot and any certificate of compliance shall be withdrawn for the materials.

### 3.1.7 Suspension and Warning

A treating plant participating in the WWPI Mark Program suspended for cause from applying the Quality Mark to its products while under license of one Quality Control Agency shall not apply the Quality Mark under license of another Quality Control Agency until it has successfully re-qualified with the original Quality Control Agency. A treating plant placed on warning for cause by its licensing Quality Control Agency shall not apply the Quality Mark under the license of another Quality Control Agency. Upon suspension and warning WWPI will be notified.

## 4 MARKING

### 4.1 Proper Identification

To insure that treated material produced by producers participating in the WWPI Mark Program is properly identified as being produced in compliance with these Quality Assurance Inspection Procedures, it shall be legibly stamped, branded, marked, end tagged, or otherwise have permanently affixed a quality mark containing the following information:

#### 4.1.1 Identity

Identification of the treating plant.

#### 4.1.2 Preservative

Preservative code and retention as specified.

#### 4.1.3 Mark

BMP registered logo where authorized, i.e.:



#### 4.1.4 Arrangement

The information required by this procedure shall be arranged in the Quality Mark format in compliance with the AWPA Standard M-6 and generally accepted industry formats. The BMP Mark may be included with other quality information or placed separately.

#### 4.1.5 Material Packaging

A Treater may not mix in one package material which bears the quality Mark with material that does not bear the Quality Mark.

#### 4.1.6 Location

The location of the quality marks shall be according to industry standards and/or user requirements.

## 5. REINSPECTION

### 5.1 Reinspection in General

5.1.1 The settlement of a dispute between the producer and the customer or user of the product, as to any BMP attribute, shall be made by the Quality Control Agency.

5.1.2 Reinspection privileges shall be available to both buyer and seller upon request for the purpose of determining compliance with purchaser BMP specifications and effecting the settlement of compliance and invoices.

5.1.3 Product compliance with the requirements of the applicable BMPs is the responsibility of the Treater for 10 calendar days after receipt of the shipment provided the shipment is not in use. Partial use of the shipment shall not prejudice the right to re-inspection of the remaining portion as long as the unused portion is in the form in which it was shipped.

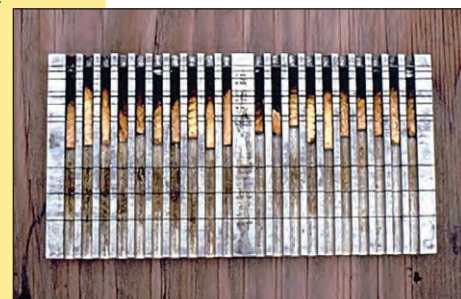
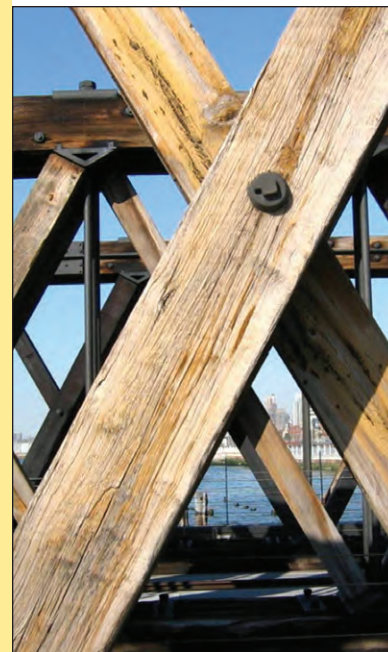
#### 5.2 Procedure

5.2.1 In performing Reinspection for treatment attributes, the Agency shall employ those tests approved in the applicable AWPA M or A standards (latest edition).

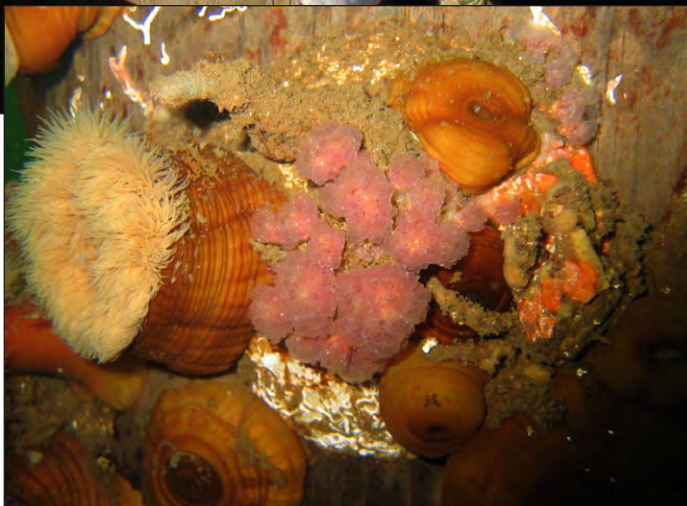
5.2.2 All attributes of treatment appearing on the Quality Mark or certificate shall be checked.

5.2.3 Complaints may be filed for illegible marks, incorrect marks and no marks where the Quality Mark has been specified. The Agency Quality Marks may be applied by qualified personnel of the Agency after compliance to applicable BMPs has been confirmed. Where material has been marked incorrectly, the mark shall be removed by any suitable means and any certificate of compliance shall be amended.

5.2.4 Lots failing to conform to BMP requirements shall be clearly marked as non-conforming and when possible separated from conforming material.



*A minimum of twenty core samples are randomly taken from each charge of treated wood to measure depth of penetration.*



*Plumose anemones (Metridium senile)*  
and compound ascidians (*Disaplia occidentalis*)



### 5.3 Compliance Variance

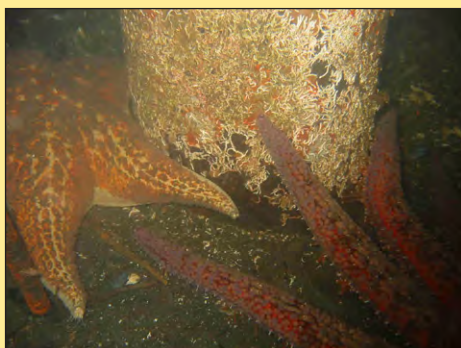
5.3.1 When 95% or less of a shipment or individual lots in a shipment conforms to the BMP requirements, the shipment or each lot of the shipment which fails shall be considered non-conforming and the Treater shall pay the cost of re-inspection. When a shipment or the lots within a shipment is more than 95% in conformance with the BMP requirements, the shipment or the lots within the shipment shall be considered conforming and the user shall pay the cost of Reinspection.

5.3.2 A customer is not required to accept non-conforming material. Non-conforming material found at Reinspection shall be corrected or have the quality mark removed or the certificate of compliance withdrawn.

### 5.4 Records

Reports shall be issued to all parties to the compliant and copies shall be kept by the Agency for a minimum period of two years.





*Sunflower starfish (Pycnopodia helianthoides) and a leather star (Dermasterias imbricata)*

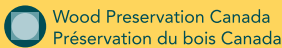


*If you have questions, need additional copies of this document, or guidance on specifying treated wood in aquatic environments, please contact:*



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